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Peer Mediated Social Skills Training

by

© LINDA MAUREEN CHMILIAR

A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF Master of Education

IN

Special Education

Department of Educational Psychology

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Date: ...October...9....., 1986

Abstract

Research indicates that the absence of peer interactions may have negative consequences. This investigation examined changes in low interacting children's behavior and peer acceptance resulting from peer mediated techniques, with adult direction, to social skill training. Three kindergarten children with low teacher rankings/ratings who also scored low on behavioral and sociometric measures were assigned to a skill training condition utilizing a multiple baseline design. During Phase I of treatment trained peers initiated to the low interacting children prompting and praising social responsivity. In Phase II the same trained peers prompted and praised initiation behaviors. Adult direction was provided as necessary to encourage social interaction. Two observational assessments were conducted for each treatment session throughout baseline and treatment phase conditions. Sociometric and teacher assessments of social behavior were conducted upon completion of the experimental procedures. The children spent a greater percentage of time engaging in social behavior during phase I and phase II than in baseline conditions, and also evidenced gains in classroom peer acceptance and teacher ratings.

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CHAPTER 1

INTRODUCTION

The Problem

In the last few years there has been growth in interest in children's social skill or competence. Several studies have examined social competence and demonstrated that many preschool and elementary school children fail to acquire any friends or have only a few friends at best. Hymel and Asher (1977) reported 11 percent of children studied received no friendship nominations and another 22 percent received only one. Gronlund (1959) and Kuhlen and Lee (1943) reported similar results.

The results of these studies are of concern as there are many negative consequences of having few friends or of not being accepted by one's peer group. Unpopular children are more likely to be low achievers in school (Bonney, 1971; Kohn & Rosman, 1972), to experience learning difficulties (Amidon & Hoffman, 1965) and to drop out of school (Ullman, 1957) than their socially accepted peers.

The consequences of low peer acceptance may go beyond academic problems. Longitudinal and retrospective studies indicate that childhood social isolation is associated with later appearing behavior disorders. Children who are isolate during school years were represented disproportionately in groups of juvenile delinquents, school dropouts during adolescence and adults who experience adjustment

problems (Roff, Sells & Golden, 1972). Other longitudinal research (Cowen, Pederson, Babigan, Izzo & Trost, 1973; Michael, Morris & Sorokes, 1957) revealed that children identified as socially withdrawn were more susceptible than socially competent youngsters to be referred to psychiatric services as adults. Similarly, Rolf (1972) presented data that indicated a negative correlation between adult psychopathology and sociometrically evaluated peer acceptance. A series of retrospective studies (Birren, 1944; O'Neil & Robins, 1958) showed that a large percentage of adults demonstrating psychopathology were described by caregivers and teachers as withdrawn as young children.

However, Strain, Cooke and Appolloni (1976) pointed out that both longitudinal and retrospective paradigms are methodologically suspect. Evidence linking peer relations to emotional vulnerability is correlational in nature. Emotional vulnerability could lead to poor peer relations as well as the reverse. In addition, the majority of the studies relied on sociometric data that, although generally an excellent measurement procedure with good reliability and validity may have shortcomings. Sociometric measures do not provide information as to the origin of the problem and do not identify factors maintaining the problem. What is responsible for relating or contributing to the child's sociometric status remains largely unidentified. Yet, the balance of evidence does suggest that social withdrawal in childhood can be a persistent pattern for later interaction and that later interaction can contribute to behavioral difficulties in adulthood.

Peer relations from early childhood may also be a prerequisite for successful development across a broad range of individual competencies. Children may be developmentally "at risk" when they do not experience successful encounters with peers (Hartup, 1977). Peer interactions are essential to the normal development of children in a number of areas.

1. Attachment and Sociability. Peer involvement may be linked to producing outgoing, active, non-anxious and assertive behaviors in children (Hartup, 1983).
2. Aggression. The context of peer interactions provides exposure to rough and tumble play necessary for aggressive socialization. Children learn to master aggressive impulses within the context of the peer culture (Patterson, Littman & Bricker, 1967).
3. Sex. Sexual attitudes and basic sexual repertoire are shaped primarily by contacts with other children (Kinsey, Pomeroy & Martin, 1948).
4. Moral Development. Both the quantity and quality of social participation and conversations are related to the child's moral development (Berndt, Caparulo, McCartney & Moore, 1980; Keasey, 1971).

In addition, peer relations are egalitarian in nature containing large residuals of reciprocity. They involve give and take exchanges which are an essential element in social skill. The reciprocal element in peer interaction seem to underlie both aggressive and sexual socialization, socialization of moral values and contributes to social competence. In addition, social interaction patterns have demonstrated

stability. Waldrop and Halverson (1975) found that young children with low sociability demonstrated the same behavior pattern five years later. Social withdrawal cuts across all categories of exceptionality and can emerge for a variety of biological and environmental reasons.

In summary, withdrawn social behavior is a stable pattern of behaviors that is correlated with a variety of developmental processes both interpersonal and intellectual. Children with a deficiency may also be at risk for experiencing subsequent adult psychopathy. Given the possible negative consequences of social withdrawal on development, detecting and modifying social withdrawal at an early age is critical. There is a need for systematic and effective strategies for the implementation of programs to modify social behavior of young withdrawn children.

Purpose

The purpose of the study was to examine the effects of two phases of peer mediated social skill intervention on the social behavior of socially withdrawn kindergarten children. The peers for this approach were trained to initiate, prompt and reinforce interactions with the socially withdrawn target child in Phase I, and prompt and reinforce the withdrawn child for social initiations in Phase II. Adult direction in the form of prompting and reinforcement was provided as necessary to encourage interactions and was gradually faded. The aim of the two phases of intervention was to increase the percentage of time the

withdrawn children would engage in positive social behavior with peers in the treatment sessions.

Research Questions

Subsumed within the question of investigating the effects of the two phases of intervention on the percentage of positive social behavior are a number of additional research questions. They are as follows:

1. Generalization: At what level will the social interactive behaviors generalize to the classroom free play setting following the treatment sessions?
2. Maintenance. At what level will the socially withdrawn children maintain positive social behaviors at a one-month interval following the conclusion of the intervention?
3. Sociometrics. Will the socially delayed children receive increased scores in peer rating and nomination procedures following intervention?
4. Teacher Perceptions. Will the socially withdrawn subjects show increases in teacher rankings and ratings as a result of the intervention?
5. Specific Social Behaviors. How will the two phases of intervention effect the specific behaviors of initiations, responses, percentages of talk behavior, percentage of time spent in continued interaction and average length of interaction?

Definition of Terms

Social skill or competence is a rather inexplicit term used to describe a rather wide range of behavior, varying in kind and complexity, that is thought to be necessary for effective social functioning. Libet and Lewinsohn (1973) defined social skill as the ability to behave in ways that are positively rewarded by others and not to behave so that one is punished or ignored by others. Combs and Slaby (1977) define social skills as "the ability to interact with others in a given social context in specific ways that are societally acceptable or valued and at the same time personally beneficial, mutually beneficial, or beneficial primarily to others" (p.162).

Others have conceptualized social skill in somewhat more global terms (Asher, Oden & Gottman, 1977; Asher, Singleton, Tinsley & Hymel, 1979; Gottman, 1977). They view social skill level as being reflected in the degree of a child's acceptance in the peer group. Those children with a high degree of social skill are likely to be more accepted by peers than children who are less well accepted by peers.

A slightly different approach to identify social skill involves a competence correlates approach in which certain behaviors have been shown to correlate with a criterion of social competence (i.e., peer acceptance level). Oden and Asher (1977) found that four general categories of behavior appeared to predict social acceptance: participation, cooperation, communication and validation support. Similarly, Gottman, Gonso and Rasmussen (1975) found that well accepted

children displayed significantly higher rates of greeting, asking for and giving information, extending an offer of inclusion, and effective leave taking in role playing situation.

In view of the complexity of the construct of social skill or competence, no single definition is adequate and sufficiently comprehensive to include all social interactions.

A number of other definitions are utilized within the context of this study.

Social interaction. This involves reception of social interaction from peers and initiation of social interaction toward peers. It may be verbal or nonverbal.

Social interaction code. Five second, five-category interval recording coding system that allows observer to record individual children's social interaction. The code provides a percentage of positive social behavior, percentage of talk behavior, percentage of interactions that are continued, rate of starts, rate of answers and average length of interactions.

Initiations. Behaviors which may begin an interaction with one or more peers and may be verbal or nonverbal not apparently elicited by another person's immediate proceeding initiation.

Responses. Behavior which is in response to a peer's initiations.

Start rate. As recorded on the social intervention code it is number of starts/initiations per minute.

Answer rate. As recorded on the social interaction code it is number of responses per minute.

Social withdrawal. An absence of peer social interaction. Child typically refrains from social interaction with peers, inability to communicate to peers in their environment.

Positive social behavior. This covers all aspects of positive social behavior. It includes the behaviors of organizing play, sharing, assisting, talking, touching and smiling. It also includes game related behaviors such as waiting for turn. This will be measured using the social interaction code.

Peer reinforcement. The peer rewards the child in a positive way either verbally or motorically.

Peer initiations. This is where the peer encourages the target child to interact. He/she attempts to engage the child in a play activity.

Peer prompting. This refers to what the peer says and does specifically to get the child to perform a specific social behavior.

Delimitations

In this study, the target subjects were three socially withdrawn children, four years 11 months to six years of age enrolled in a kindergarten in the Edmonton Public School System. These three children were selected for intervention as they scored low on teacher ratings and rankings, received low scores on the sociometric measures of peer ratings and peer nominations and were observed to demonstrate low rates of social interaction utilizing the Social Interaction Code observational system. The peers who were trained to carry out the

intervention procedures were also enrolled in the class staffed by one certified E.C.S./Special Education teacher and one instruction aide.

The study took place over an eight month period with subject selection taking place in November/December intervention from January through April and follow up in May/June. During baseline and treatment phases observations of each child were conducted two to three times weekly for a total of 12 weeks per child. During each observation period, a total of 10 minutes of observational data was collected for each child under study, 5 minutes in the treatment setting and 5 minutes in the classroom freeplay setting. The observational system allowed for the continuous recording of all of the codable behaviors of the child when they participated in play sessions. A multiple-baseline across subjects was used in order to evaluate the effects of the treatment.

Limitations

The study's generalizability is limited in that the children were not randomly sampled, but represented part of an intact kindergarten class. The target subjects were chosen because of their low sociometric scores, teacher rating and ranking scores and low levels of social interaction as observed utilizing a social interaction observation code. In addition, the age range of the children was limited to five to six years of age and although the subjects were not selected by sex all three target children were boys. The generalizability is also limited in that the sample size was small and only one setting was utilized.

In order to improve the generalizability of the results, the treatment results were replicated over all the subjects. In addition, although all three subjects were selected on the same criterion, their characteristics in terms of intelligence level, background experiences and range of problems was heterogeneous. The single setting makes it possible to identify the variables responsible for the treatment effects across subjects.

A lack of control over certain extraneous variables which is inherent in naturalistic applied research places some limitations on the degree of confidence with which inferences concerning treatment effects can be made. In particular, the use of observational methodology can pose a significant threat to the internal validity of this study through such factors as observer bias, observer drift or the reactivity of the measurement process. However, as will be discussed in Chapter Three, caution was exercised in the design and use of the observational methodology, in order to minimize the confounding effects of those factors.

Significance

This study closely examines in detail the effects of two phases of peer mediated social skill intervention on the social behaviors of three kindergarten children. It demonstrates that not only can preschool trained peers successfully initiate, prompt and reinforce social behaviors of withdrawn children, but they can also teach specific social

behaviors such as initiations. This study also demonstrates that the positive social behavior gains made by the withdrawn subject using this method are generalized to the classroom and maintained over a one month time period. Data demonstrating gains in sociometric status and teacher judgments of social competence are also generated.

Overall, the two phases of peer mediated social skill intervention coupled with minimal adult intervention suggests that this type of intervention has possibilities for use in kindergarten situations.

CHAPTER 2

LITERATURE REVIEW

Introduction

The literature on early peer relations previously reviewed indicates that successful interactions with peers are necessary for normal growth and development (Hartup, 1977). Without such contact, children are prone to developmental delay and moreover, social isolation may result in behavior difficulties throughout life. Effective intervention techniques must be employed to influence the socially withdrawn children to develop appropriate social behaviors.

Adult Intervention

In the last decade increased attention has been focused upon peers as intervention agents to facilitate social interaction. This movement has been based on empirical and practical considerations. First, adult mediated techniques which can produce and maintain increased levels of social behavior are difficult to apply in applied settings (Strain & Fox, 1981). For example, the use of contingent adult attention to modify social behavior requires considerable teacher time and attention.

Second, adult attention as an effective agent of change may be limited by a number of factors. Contingent adult attention can produce substantial increases in the percentage of positive social behavior

exhibited by the child, but may not be successful in developing typical social intervention. Strain and Fox (1981) found that the day-to-day effect of adult intervention was an increase in the frequency of discrete social events, however the intervention limited the duration of social exchanges. Adult reinforcement may even serve to terminate ongoing interactions between children (Strain, 1980), or produce increases in brief, artificial interactions (Hops, Walker & Greenwood, 1979). In play activities, there are many situations in which the child's behavior following an adult-controlled intervention program remains dependent on the presence of the adult (Redd, 1970), or contingent adult attention may actually distract the child from ongoing peer interventions (O'Connor, 1972). Moreover, Shores, Hester, and Strain (1976) noted that the presence of adults during play tended to reduce the extent of child-child interactions. In the area of promoting social interactions, contingent adult attention and related adult directed techniques may, as shown previously, be detrimental to successful social skill intervention. However, adult intervention may play a critical role in some instances.

Contingent teacher attention can bring children into situations in which they are more likely to experience social interaction (Buell, Stoddard, Harrist & Baer, 1968) as well as provide consequences that will reduce behavior that will interfere with positive interactions (Twardosz & Sajwaj, 1972). In addition, children who display very low levels of social interactions may require the direct assistance of

adults in the form of prompting and reinforcement to establish initial levels of social interactive behavior.

Peer-Mediated Intervention

Evidence from naturalistic-observational research (Charlesworth & Hartup, 1967; Guralnick & Paul-Brown, 1977) and intervention (e.g. Johnston & Johnston, 1972) indicates that peer interaction is not a random process, but rather that numerous peer contingencies have a significant impact on the development and maintenance of peer interactions. Children exert a powerful influence on each other's social behavior. If peer influence plays a dominant role in the natural development of social competence, then it seems logical and reasonable to use peers in the purposeful development of withdrawn children's social skill. In addition, peers must play a central role in treatment if new levels and patterns of social responsiveness are to maintain following the termination of intensive intervention (Strain & Fox, 1981).

The purpose of this section is to examine the developing body of literature on the use of peers as effective and efficient instructional resources to influence behavior change in socially withdrawn children. A description of peer mediated strategies have been reported in the literature: a) peer reinforcement, b) peer social initiations, c) live peer modeling/imitation, d) combinations of peer strategies, and e) peer tutoring.

The first strategy, peer reinforcement, involves training peers to reinforce desired behaviors emitted by the target children. Wahler (1967) examined the effects of peer reinforcement and ignoring on subject children's patterns of behavior. He found that children's social behavior could be affected by peers contingently attending to or ignoring specific behaviors. Further, Johnston and Johnston (1972) found that contingent peer attention was as successful as a token system and teacher attention in improving rates of correctly articulated speech sounds, and was the only strategy to produce generalized effects in other settings.

Peer social initiations, the second strategy, involves training peers, within a role-playing situation, to use verbal and motoric behaviors in initiating social interactions with the target child. This strategy has been successful in increasing target children's positive social behavior in terms of both responses to the initiations of others as well as the number of positive initiations emitted by the target child (Raglund, Kerr & Strain, 1978; Strain, 1977; Strain, Kerr & Raglund, 1979; and Strain, Shores & Timm, 1977).

Despite the success of the peer initiation approach there appears to be a direct relationship between the level of social behavior of the subject prior to treatment and generalized outcome of treatment (Strain, 1977; Strain et al., 1977). Children who demonstrated very limited verbal and social behaviors prior to intervention exhibited marginal increases in social behavior during treatment and limited generalization. This suggests that these children may require more

intensive training procedures such as adult prompting and reinforcement to initially draw them into the social interaction.

The third strategy, live peer modeling, involves withdrawn children viewing a peer engaging in specific positive social behaviors. Apolloni and Cooke (1975) described a series of studies (Apolloni, Cooke & Cooke, 1977; Cooke, Apolloni & Cooke, 1976; Cooke, Cooke & Apolloni, 1977; Peck, Apolloni, Cooke & Cooke, 1976) where withdrawn/delayed children were successfully taught to imitate behaviors modeled by peers such as verbal skills and social behaviors with adult prompting and reinforcement. Live models can facilitate the performance of discrete social behaviors and of more complex interactions.

Peer reinforcement, social initiations and peer modeling constitute rather distinct intervention techniques. Several studies have involved the use of peers in a combination of procedures that do not fit easily into well-defined categories. These procedures may include a combination of peer prompting, reinforcement and modeling. Guralnick (1976) found that a combined strategy of peer modeling, prompting and reinforcement produced a substantial change in the social play and verbal interaction between the trained peers and the withdrawn subjects. Shafer, Egel and Neef (1984) reported that a peer training strategy of direct prompting and modeling resulted in higher levels of positive social interaction between the peers and subjects. In addition, these increases were maintained during free play probed and untrained peers subsequently increased interactions with the subjects.

The fourth and final strategy, peer tutoring, also involves the use of a combination of peer strategies. However, the use of these strategies is to teach specific social behaviors rather than to elicit social participation and interaction. The benefits of peer tutoring are believed to include increases in motivation and task involvement. In addition, increases in self-esteem, prosocial behavior and positive attitudes towards school are believed to occur, although the evidence is not consistent (Hartup, 1983). Children are effective teachers of one another as tutoring utilizes the potential existing in peer interaction for constructive educational ends (Hartup, 1979). Lancioni (1982) found that normal children could teach specific social responses to retarded, withdrawn, elementary school age peers. Target subjects developed skills in the areas of imitation, cooperative play, and verbalization of positive comments through the use of peer modeling, reinforcement and prompting.

Peer mediated intervention offers many instructional strategies that may be employed to improve the social functioning of the withdrawn child. Peer initiations, contingent social reinforcement, prompting and modeling are all procedures which have demonstrated effectiveness in improving social skill. Peer tutoring has also been effective and it utilizes the proven effectiveness of the other peer mediated strategies. In addition, peer mediated strategies produce gains equal to, or greater than those associated with adult-mediated intervention and research appears to indicate that a higher level of generalization and

maintenance is seen as the result of peer mediated treatment (Strain & Fox, 1981).

Summary

In summary, there is a need for intervention for children who exhibit a low incidence of social interaction in the preschool years given the overall stability of social behavior patterns and the possible negative consequences of social withdrawal. Peer mediated procedures utilizing peer initiations, prompting and reinforcement to both elicit and/or teach social behaviors offer an alternative for remediation of social withdrawal. These procedures coupled with adult directed techniques such as prompting and reinforcement to draw withdrawn children into the interaction and prevent conflicting behaviors could prove to be very effective in modifying withdrawn social behavior patterns in preschool children.

Generalization and Maintenance

An important consideration for any social skills training program is how to increase effectiveness by ensuring that newly acquired social skills will be applied in situations outside of the treatment setting. This is usually termed generalization. The rationale for emphasizing generalization is that "a functional behavior change, to be effective, often must occur over time, other persons and other settings, and the

effects of the change sometimes should spread to a variety of selective behaviors (Stokes & Baer, 1977).

Generalization does not naturally occur as the result of most educational training programs (Baer, Wolf & Risley, 1968; Kazdin, 1980). Generalization requires an active role on the part of the trainer and must be programmed into the teaching situation. Procedures to promote generalization need to be a focus in all training strategies. Stokes and Baer (1977) describe several procedures for promoting generalization beyond the training setting, including maintenance over time and transfer across settings. They are as follows:

1. Teach behaviors that will be supported by the natural environment. In using this procedure training is designed to ensure that the new repertoire of behaviors will be supported and maintained by natural contingencies in the child's environment.

   In social skills training, the social interaction skills taught should be supported by peers. For example, following the learning and practice of social initiations in phase II treatment the child should experience positive consequences from other children when this skill is used in the natural environment, serving to maintain and strengthen this skill.

2. Teach a variety of responses. To obtain generalization multiple examples and responses should be included in training. Many diversified responses can be taught in social skills training through behavioral interactions that include a wide variety of situations. This increases the child's ability to function in

different situations. In this investigation a variety of play materials were utilized that required diversified responses.

3. Train loosely under varied conditions. To train loosely students are encouraged to initiate their own situations and responses, thus ensuring that something more than one particular response is learned. In this investigation the subjects received a minimal amount of direction from the adult supervisor and had to create their own interactions.

   Using varied conditions, or a variety of stimuli, can also increase the generalizability of the skills being taught in that they will be associated with many stimuli instead of a specific few. As specified previously a wide variety of play materials were utilized from basic objects to dramatic play stimuli.

4. Train in a setting common to the natural environment. Generalization is facilitated by making the training situation as similar to the natural environment as possible. In this investigation the inclusion of peers from the classroom were included in the treatment setting as well as materials from the classroom play centres.

5. Fade training consequences to approximate natural contingencies. Adult supervision in the form of prompting and praising was gradually faded according to a fixed schedule, in this investigation, until the training consequences remaining, i.e. peer reinforcement, were those resembling natural contencies in the classroom.

6. Use of peers. Peers may be useful to help maintain behavior and to ensure its transfer across settings. Peers were incorporated into this investigation in different ways through peer initiations, peer modeling, and peer reinforcement.

Several studies have reported success with the use of peer approaches in behavior generalization (Strain, 1977; Strain et al., 1977). However, in other studies the use of peers has not lead to sustained training effects (Hops, Walker & Greenwood, 1979). In the methods utilizing peers, duration of training and target populations have varied considerably. Thus, the extent to which peer training can optimize maintenance and transfer remains to be elaborated.

In summary, generalization is an important consideration of all social skill training programs. Without generalization of new acquired social skill repertoires, new social skills will probably be utilized only in the treatment setting, which is not the goal of the training program. Most importantly, generalization should be planned for in the training process. The generalization facilitators previously described were planned as an integral part of this social skills training program, hopefully maximizing the effectiveness and responsiveness of the training.

Another very important dimension of generalization is that the behavior change endures over time; this phenomenon is known as maintenance (Paine, Hops, Fleischam, Guild, Walker & Greenwood, 1978). One means to evaluate maintenance is to compare post-treatment assessment data with treatment and pre-treatment data. The child should

still be functioning closer to or above levels observed at the end of treatment than before beginning treatment. Paine et al. (1978) indicated that:

> If the follow-up is conducted more than a few days after the post-test, if it includes more than a single measurement, if the level of responding has not fallen off too sharply since intervention, and if follow-up data is not trending in a counter-therapeutic direction, then it could be concluded that a socially significant level of maintenance has been achieved (p.34).

Another procedure to evaluate maintenance is to compare follow-up data with appropriate normative data (Walker & Hops, 1976).

Summary

Generalization of newly acquired social skills to situations outside of the treatment setting is an important consideration for any social skills program. This generalization must be programmed into the teaching strategy and require an active role on the part of the trainer. Procedures for promoting generalization were considered in the treatment phases of this investigation.

CHAPTER 3

METHOD

A. Subjects

The subjects for the study were enrolled in a one-half day kindergarten in the Edmonton Public School system. This particular kindergarten was selected as the teacher had expressed a number of concerns about the social competencies of several of the children in the class and was willing to participate in the study. From this class three target children were selected on the basis of a combination of social skill measures to be discussed further in this chapter.

The initial social skill selection method was a teacher ranking. The teacher was required to list all of the students in relative order corresponding to their level of interaction. The lowest ranked child indicated that in the teacher's opinion, that child would demonstrate the lowest rate of interactive behavior while the highest ranked child demonstrated the highest rate of interaction.

After rank ordering the children, the teacher then completed a Social Behavior Rating Scale on each of the children. This teacher rating scale consisted of eighteen items on two alternate forms that examined various specific areas of social interaction skill rated on a five point Likert system. A score of one was treated as a false description, three as moderately descriptive and five rated as very descriptive. Each child's average score was determined. The children

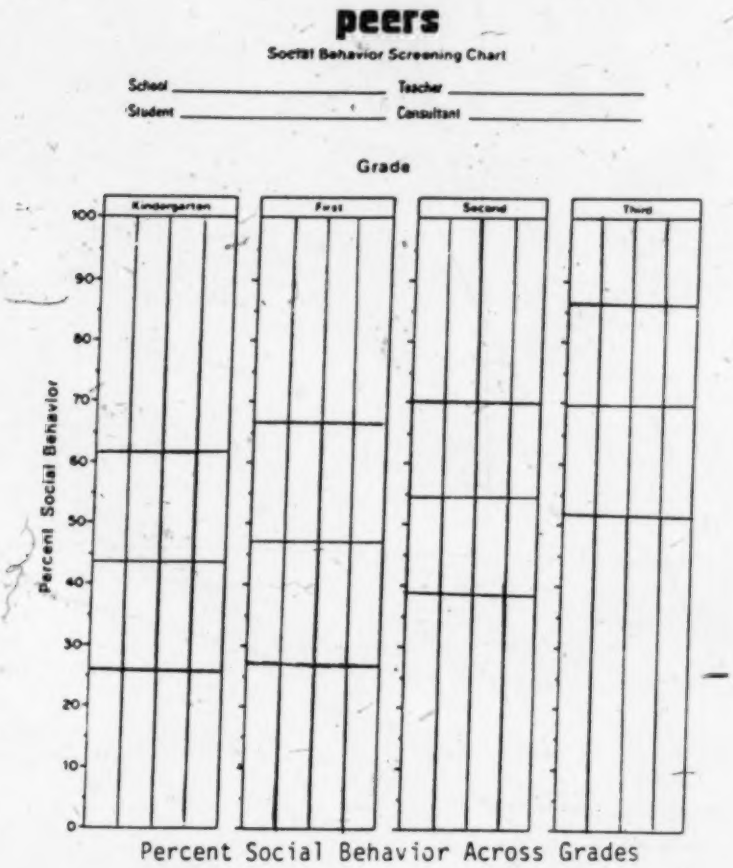
whose names were identified by the teacher as being one of the five lowest interacting in the class ranking and who received a below average teacher rating of three or less on the teacher rating were considered as target subjects.

Behavioral observations of the five identified children were conducted within three to seven days after the teacher selection process was completed. The behavioral observation consisted of three, five-minute observations of each subject, conducted over two days in classroom free play periods. Observations involved use of the Social Interaction Code which is a five second interval recording system where instances of positive social behavior, negative alone, start, answer and talk behavior were recorded. From the observations three percentages of positive social behavior were determined and the children's social behavior compared to norm charts. Hops, Guild, Fleischam, Pain, Street, Walker and Greenwood (1978) provide social behavior screening chart for kindergarten children that indicates that a percentage of social behavior below 26 percent is considered socially withdrawn (see Figure 1). This chart compares favorably to norm charts published by Greenwood, Todd, Walker and Hops (1978) that identified withdrawn levels of interaction as .25 for females and .26 for males at age five (see Figure 2). Four of the five subjects initially selected from the teacher ratings and rankings fell in the socially withdrawn range as determined by these norms.

The final stage of the selection process involved two sociometric measures. A rating scale and nominative procedure were administered in

Figure 1

Norm Chart Hops et al. (1978)



Percent Social Behavior Across Grades

Grade	Mean	Standard Deviation
Kindergarten	44%	18
First	47%	20
Second	54%	16
Third	70%	18

Figure 2

Norm Charts Greenwood et al. (1978)

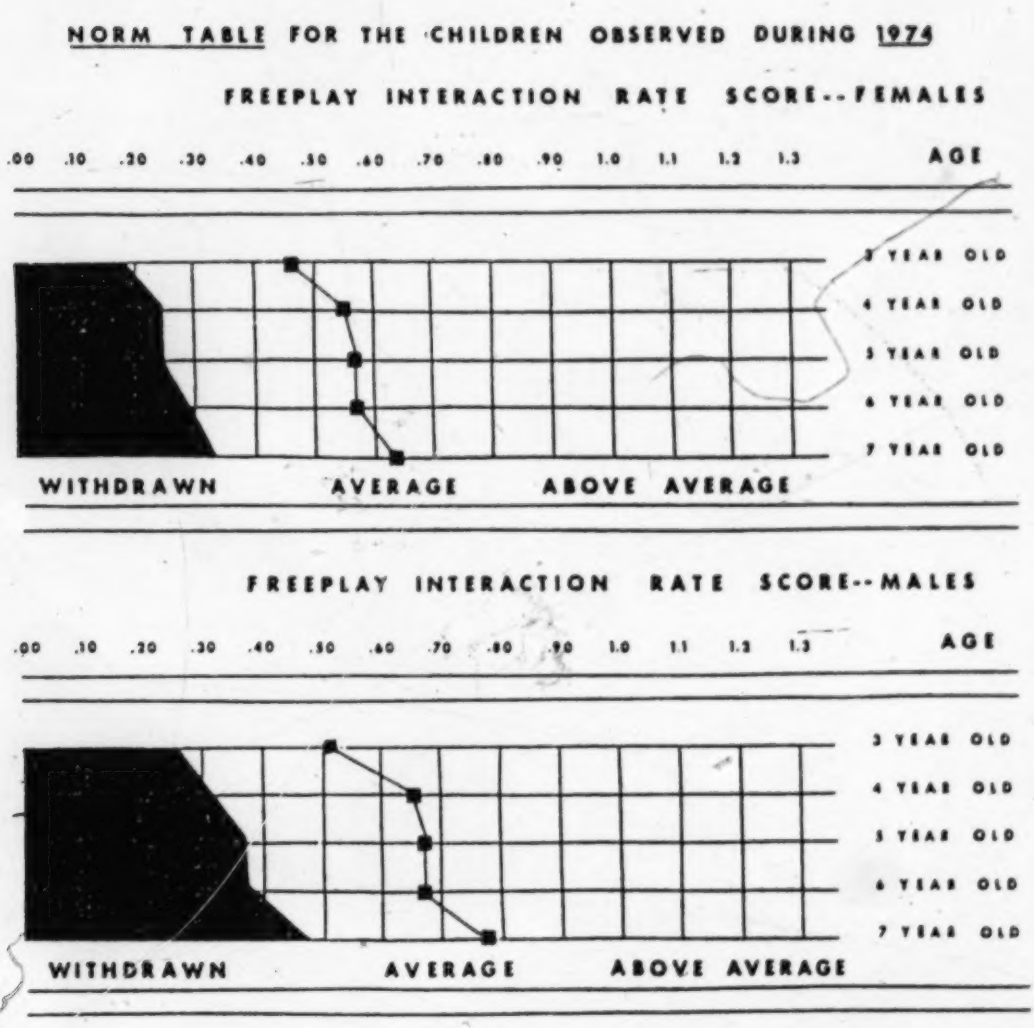
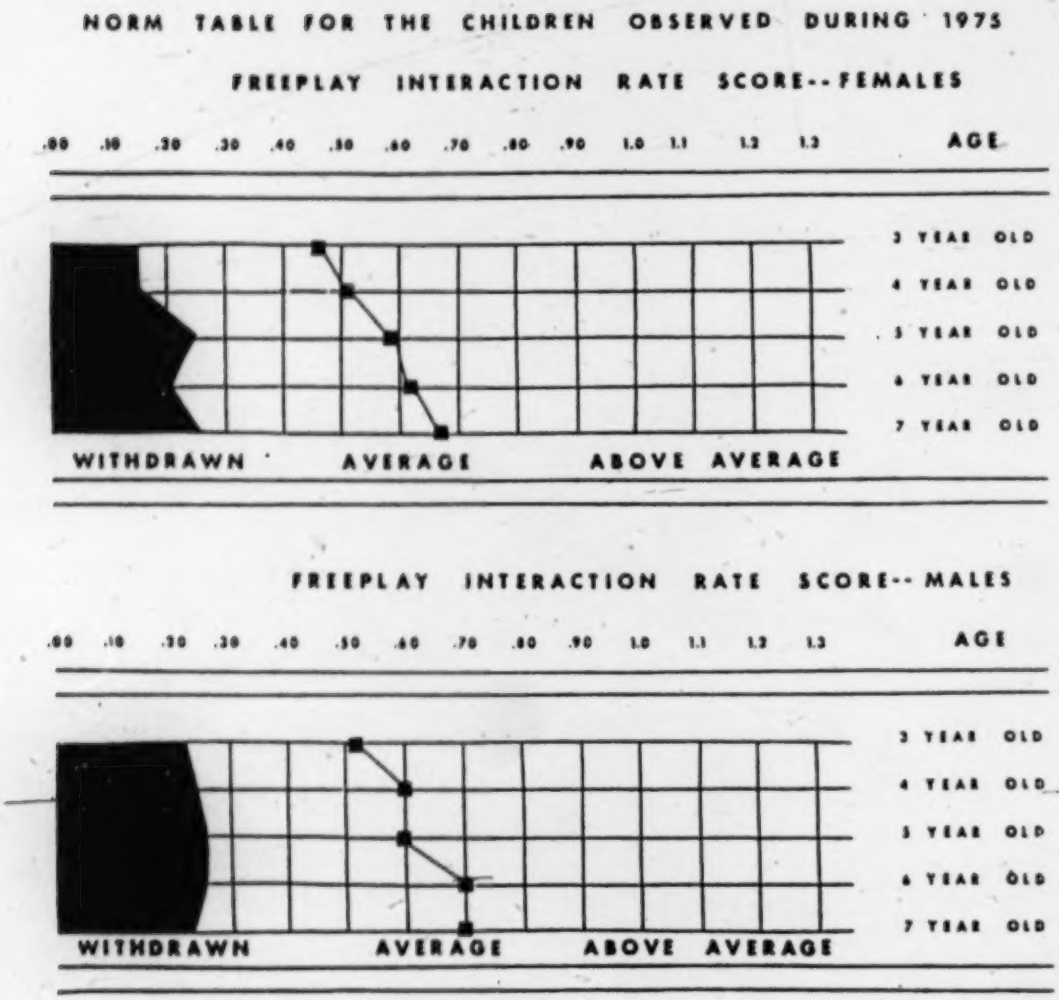


Figure 2 (continued)



the classroom, to see if in fact the four subjects identified so far were children with low peer acceptance. The rating scale requires all the children in the classroom to rate each classmate according to how much they liked to "play with" a peer by pointing to a happy face scale while viewing the classmate's picture. Each child's score was an average rating received from the entire class. The nomination procedure required each child to select from all the pictures of his/her classmates three children they would like "to play with" and three children they would not like "to play with." From the four possible target subjects only three children received low rating scores and nominations as children that their classmates would not like to play with.

The three target subjects selected were all boys ranging in age at the initiation of the study from 4 years 11 months to 6 years of age. The children displayed no physical abnormalities, were ambulatory and possessed varying levels of language competence and intellectual functioning (see Table 1).

The peers who were trained to mediate the intervention were also enrolled in this kindergarten class. They were selected on four bases: 1) they attended school regularly; 2) they had high levels of social interaction and were judged by the teacher to be socially competent; 3) they followed adult directions well; and 4) they harbored no bad feelings toward the target child with whom they were matched.

Table 1

Subject Characteristics

Subject	Date of Birth	Age at Initiation of Study	Sex	Characteristics
2	November 15, 1980	6.0	M	IQ 74 on WPPSI. Speech articulation problems, fine motor delay, behavior problems.
1	October 7, 1980	5.1	M	IQ 110 on WPPSI. Mild articulation difficulties, visual motor difficulties
3	December 2, 1980	4.11	M	IQ 89 on McCarthy Scales of Children's Abilities. Language delay, delayed readiness skills.

B. Setting

The treatment and peer training took place in a small room down the hall from the classroom. It contained a small table and chairs and play materials were available to the children to select from. The room was quiet and free from distractions.

The kindergarten classroom was staffed by a teacher trained in special education and early childhood and one instructional aide. Almost everyday a parent helper came in to assist with basic chores. Twenty-two children attended the class including the subjects in the study. The classroom was set up as kindergartens typically are with a number of play centres. The children were allowed 45 minutes of free play daily where they were allowed to choose where they would like to play with a minimum amount of adult direction. It was during this time baseline, generalization and maintenance observation data were collected.

C. Research Design

This investigation employed a single subject research design in a multiple baseline across subjects. Baseline data was initially collected simultaneously across the three individual subjects. When all baseline data, percentage of social behavior, exhibited stability in level and trend, in both classroom and treatment settings, phase 1 intervention to the first baseline series occurred. This intervention

coincided with an abrupt change in the first data series, while the other baselines remained stable. After six treatment days, intervention was introduced into the second baseline series. Again the same abrupt behavior change was demonstrated while the uninterrupted baseline series remained unchanged. This process was repeated in the third series until phase 1 intervention had been applied to each child.

The first intervention phase of the design provided a baseline for phase II. The level of target social behavior changed with the addition of phase II intervention. Again the implementation of the phase II intervention was staggered across subjects until each child received phase II intervention. Figure 3 is a graphic representation of the design across subjects and conditions utilizing data from the classroom generalization setting on positive social behavior.

Each subject was exposed to four conditions. The condition sequence for each subject was as follows: Subject 1--screen (3 days), baseline (6 days), phase I (12 days), phase II (12 days); Subject 2--screen (3 days), baseline (12 days), phase I (12 days), phase II (12 days); Subject 3--screen (3 days), baseline (18 days), phase I (12 days), phase II (12 days).

Single-Subject Design

A single-subject design was chosen as the focus of this investigation was on the individual child and how the individual learner functions in response to two phases of peer mediated social skill

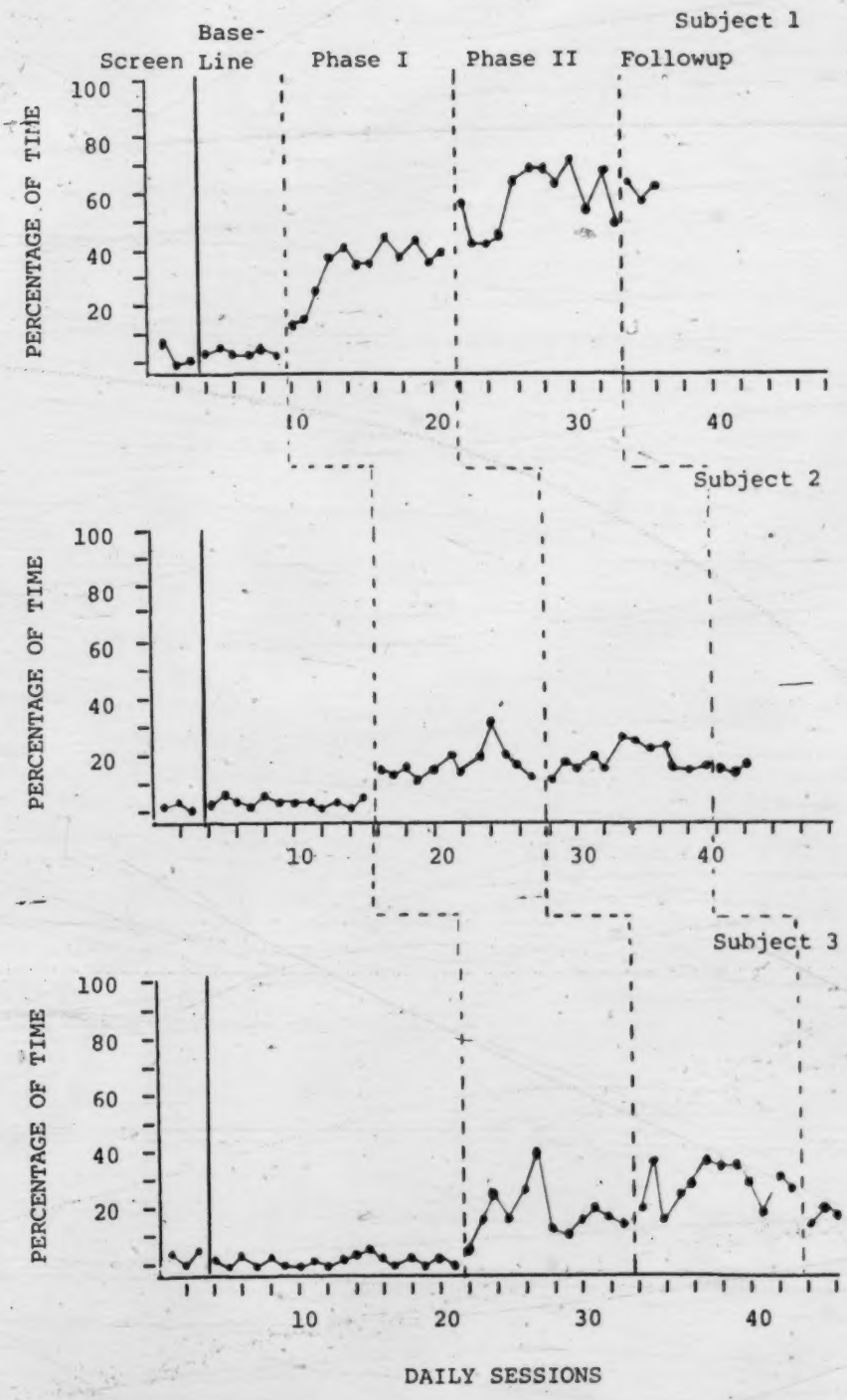


Figure 3. Multiple baseline across subjects.

intervention. Single-subject designs give a representation of the individual subject's responses to treatment variables which may not be represented by the average performance of a group of students (Borg & Gall, 1983).

Another important basis for selecting a single-subject design was that the measurement of behavior change resulting from treatment requires repeated observational measurements. Single-subject designs facilitate the measurement of the dependent variable over time. In this study the social behaviors of the target children were monitored in both classroom and treatment settings over two phases of treatment. It was important to see how each individual responded to the treatment. In addition, the examination of effects of treatments across individuals helps to identify which treatments may be suited to specific individuals (Birnbrauer, Peterson & Solnick, 1974).

Another advantage of the single-subject design is that it minimizes variability due to individual differences--a strong confounding factor in behavioral research (Sulzer-Azaroff & Mayer, 1977, p.445). The individual's behavior under one condition is compared to that under other conditions. Also, with single subject designs behavioral change is easily observed and treatment effects determined.

Multiple Baseline Design

Multiple baseline designs are often utilized in single-subject designs when the reinstatement of baseline conditions in an A-B-A type

design is not possible (Borg & Gall, 1983). This was a concern in this investigation as it may not have been possible to return to pretreatment baseline rate as the behaviors may have become naturally reinforcing if the social behavior of the subject becomes "trapped" into the existing social network (Baer & Wolf, 1970). If the target behaviors did not return to pretreatment baseline rate after treatment was withdrawn one could not conclude that the treatment had an effect, even though the target behavior changed rapidly from the initial baseline phase to the treatment phase (Borg & Gall, 1983). As an alternative, a multiple-baseline design was used to investigate the treatment.

In a multiple baseline across subjects the treatment is applied to different subjects at different points in the investigation. If the measurement of the target behaviors vary as expected, one can reasonably conclude that the treatment condition was the cause of the changes in each child's behavior. Each child's behavior is independent of the others, and this independence is demonstrated by a change in the child's behavior to which treatment is being applied while the other children's behavior maintains a stable rate. The demonstrated changes can be used to make casual inferences (Borg & Gall, 1983) as research literature indicates that the replication of treatment effects across three or four subjects is sufficient to adequately demonstrate the effects of experimental treatment (Hersen & Barlow, 1976). Further, an analysis of the treatment effects displayed by the subjects may be helpful in the formation of plausible hypothesis concerning the interaction of individual characteristics and the treatment strategies.

A multiple baseline design may be limited as prolonged baselines for individuals not yet receiving intervention may produce extinction effects and raise questions about the ethics of postponing intervention for children ready to learn (Sulzer-Azaroff & Mayer, 1977). Although implementation of the intervention was delayed for the second and third subjects the time period before treatment was instituted was a relatively short period of time.

D. Instrumentation

A total of five social skill measures were utilized in this investigation. The following section describes, in detail, the specific instruments and the manner in which they were administered.

Behavioral Observation

Natural observation was the primary measure used to evaluate the effects of the two phases of intervention. The observation system employed in this study is a modified version of the Social Interaction Code devised by Hops, Fleishman, Guild, Paine, Street, Walker and Greenwood (1978) published in the PEERS--Procedures for Establishing Effective Relationship Skills manual. This revised system utilized five distinct behavior categories which allowed the continuous recording of the behaviors of the target child. Complete definitions of each of the categories were provided (see Table 2) in order to reduce as much as

Table 2

Social Interaction Codes

Behavior Categories	Definition
"PS" = Positive Social	This is used to record all aspects of positive social behavior. Included are socially interactive behaviors directed at others which may be both verbal and nonverbal. e.g., talking, touching or smiling. Also included are game-related behaviors which are not interactive. For example if a child is waiting for a turn in a game.
"NA" - Negative Alone	This is used to record all aspects of social behavior which are negative and/or aggressive, or behavior which is nonsocial. NA can also be coded by the absence of any positive social behavior.
"S" = Start	This is used to record behaviors which may begin or initiate an interaction with one or more peers. It is recorded whether or not the peer to whom the behavior directly responds. This code is not recorded when initiations are determined by a game or activity.
"A" = Answer	This code is used to record any behavior of the observed child which is in response to peers' starts or initiations. This is not recorded when the response is required by the structure of the game or activity.
"T" = Talk	This category is used to record all unstructured verbal interactive behavior exhibited by the child being observed. Talk behavior may be double coded in the same interval as Starts or Answers when they occur simultaneously.

possible the amount of interpretation and judgment used by the observers when coding behaviors.

In this investigation observers manually recorded behaviors using prepared data sheets. Each sheet contained ten rows of boxes, six separate boxes in each row for a total of sixty boxes. Within each box was a series of five letters representing each behavior category given. Each box was identified sequentially by a number from one to sixty which corresponded to a five second interval with a beep on tape also identified by a number. The occurrence of the codable behaviors during the interval was recorded by a slash. Each five second interval required the coding of a PS to indicate the child being observed was behaving in a positive socially acceptable manner, or an NA to indicate either socially negative/aggressive or nonsocial behavior. Either PS or NA must be recorded in each interval.

In addition to either of these codes a S, A, and/or T to indicate an unstructured start, answer and/or talk. T is coded for verbal behavior whether or not S or A have also been recorded.

As ongoing behavioral exchanges between a child and a peer are coded, a five second rule based on the five-second coding box is used to help decide if an interaction has terminated and a new one begun, or if the same interaction is still going on. Initiations by the child, or child responses to new initiations by the same peer are not coded unless they follow one or more intervals in which no starts or answers have been coded. That is, if one or more five second intervals intercedes between interaction instances, they are considered two separate

interactions. Otherwise, they are counted as one continuous interaction. T is coded, however, in any interval in which the child talks in a socially acceptable (unstructured) manner to any peer. The format of the data sheet employed by the observers is illustrated in Figure 4.

Data collection was conducted two to three times weekly for each subject through live observations in the treatment and classroom settings. The decision to use live observation, as opposed to video, was based on the fact that space was limited in both settings and the necessary equipment was a distraction for the subjects. In addition, videotaped episodes of social interaction are often difficult to code as behaviors may not be portrayed clearly in a taped presentation. Live observers are more able to perceive behaviors and it has been demonstrated that minimal amounts of information are missed through the use of live observations (Sackett, Ruppenthal & Gluck, 1968).

Reliability of Observations

Observational methodology was the primary measure used to evaluate the effects of the phases of intervention. Naturalistic observation is the most face valid method of assessing children's social skill (Gresham, 1981) and it has several advantages. Naturalistic observation is sensitive to the effects of social skill intervention techniques (Bellack, 1979). They reflect changes in behavior after treatment and are more likely to pick up changes than more global measures such as

Figure 4

Social Interaction Code

Name _____ Date _____

Teacher _____ Consultant _____ Page _____

Treatment/In-Class _____ Phase: Screen ☐ Baseline ☐ Phase I Intervention ☐ Phase II Intervention ☐ Follow-up ☐

1	2	3	4	5	6
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
7	8	9	10	11	12
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
13	14	15	16	17	18
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
19	20	21	22	23	24
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
25	26	27	28	29	30
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
31	32	33	34	35	36
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
37	38	39	40	41	42
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
43	44	45	46	47	48
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
49	50	51	52	53	54
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T
55	56	57	58	59	60
NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T	NA PS S A T

Tally	To Find	Compute	Results
NA ____	Total Boxes	____(PS) + ____(NA)	____* TB
PS ____	Total Minutes	____(TB) ÷ 12	____* M
S ____	Percent Positive Social	____(PS) ÷ ____(TB) X 100	____ %PS
A ____	Percent Talk	____(T) ÷ ____(TB) X 100	____ %T
T ____	Start Rate	____(S) ÷ ____(M)	____ S/minute
P ____	Answer Rate	____(A) ÷ ____(M)	____ A/minute
TB ____	Interaction Rate	(____(S) + ____(A)) ÷ ____(M)	____ I/minute
	Start:Answer Ratio	____(S) ÷ ____(A)	____ S:A

teacher ratings. Naturalistic observations are conducive to repeated measures allowing the monitoring of the daily variability of a child's social behavior and to establish trends in his/her pattern of responses. It also allows assessment of changes in behavior and observations collected in the natural environment that assess operationally defined individual behaviors focus on objectivity (Gresham, 1981).

As observational methodology was the primary measure used to evaluate the effects of the two phases of intervention, it was critical that factors which could adversely affect the reliability and accuracy be minimized. Five general categories have been considered to be threats to the reliability of observation systems: 1) observer bias, 2) the effect of the observer on the observed, 3) contamination, 4) observer drift, and 5) the complexity of the behavior code (Bijou, Peterson & Ault, Borg & Gall, 1983; 1968; Johnson & Bolstad, 1973; Kazdin, 1977, 1978). Each of these factors will be examined and discussed in terms of how they were dealt with in this investigation.

1. Observer bias. This type of bias refers to systematic errors that are traceable to characteristics of the observer or of the observational situation. This produces errors in a single direction, yielding scores consistently too high or low (Borg & Gall, 1983). It is doubtful if any observations conducted are completely free from bias as in the observation process each observer brings into the situation past experiences, perceptions, emphasis and interpretation. This form of bias was controlled

somewhat through obtaining high levels of interobserver agreement (see Table 3) on weekly observations. Generally the combined records of two or more observers provide more reliable data than the data of a single observer. In addition, biases have a greater chance of operating when the observer is required to draw conclusions or make inferences from behavior observed (Borg & Gall, 1983). In this investigation the observers were only required to code observed behaviors and the tallying and interpretation of results occurred at another time minimizing this source of error.

2. The effect of the observer on the observed. This category can be defined as the effects which "occur when the process of observing a subject or subject alters, either permanently or temporarily, their behavior" (Haynes & Horne, 1982, p.370). If this occurs data based on recorded observations will be nonrepresentative of the actual behavior and thus passes little or no validity (Borg & Gall, 1983). Factors that may mediate reactive effects of observation such as having the observers refrain from interacting with the subjects (Bijou et al., 1968) and not recording any observation for the first five or ten minutes in the classroom free play situation (Borg & Gall, 1983) were utilized in this investigation. In addition, the students being observed were not aware of the purpose of the observations. Finally, given the extended period of measurement, the effects of being observed can be expected to dissipate (Haynes & Horne, 1982).

Table 3

Interobserver Agreement Scores for the

Social Behavior Subcategories by Condition

Category	Mean Agreement	Range of Agreement (%)
Positive Social		
Prescreen	98.7	98 - 100
Baseline	98.4	93 - 100
Phase I	95.5	93 - 98
Phase II	89.4	83 - 95
Follow-Up	87.3	85 - 90
Negative Alone		
Prescreen	98.7	98 - 100
Baseline	98.4	93 - 100
Phase I	95.5	93 - 98
Phase II	89.4	83 - 95
Follow-Up	87.3	85 - 90
Starts		
Prescreen	98.7	98 - 100
Baseline	98.8	93 - 100
Phase I	96.8	93 - 100
Phase II	90.5	93 - 98
Follow-Up	92.7	90 - 95
Answers		
Prescreen	99.3	98 - 100
Baseline	99.2	98 - 100
Phase I	95.9	90 - 100
Phase II	94.3	88 - 97
Follow-Up	93.0	88 - 98
Talk		
Prescreen	99.3	98 - 100
Baseline	99.1	93 - 100
Phase I	98.7	97 - 100
Phase II	96.7	95 - 100
Follow-Up	95.0	90 - 98

3. Contamination. Contamination occurs when the observer's knowledge of aspects of the study tends to corrupt his/her perception of the data recorded. The most common souce of contamination is the influence of the observer's knowledge concerning the performance of the subjects on one of the variables being studied on observation of another variable (Borg & Gall, 1983).

Observer expectations are also a powerful source of contamination. Research has demonstrated that an observer's expectations can have a significant effect on how data is recorded and interpreted. The observer's expectancy of change may influence the obtained results (Azrin, Holz, Ulrich & Goldiamond, 1961), however some research literature suggests that expectancies do not significantly alter the behavior of the observers (Kent, O'Leary, Diament & Dietz, 1974; Redfield & Paul, 1976). In this investigation, one of the two observers was not informed at the time at which treatment was implemented and with which subject to try to minimize the probability of confounding effects. Interrater reliability checks between the informed and uninformed observer were conducted periodically to check. In addition, the teacher observer was provided with feedback concerning the accuracy of observations, but was not informed as to whether the results reflected the behavior change desired by the investigator (Kazdin, 1977).

4. Observer drift. Observer "drift refers to the tendancy of observers to change the manner in which they apply the definitions

over time" (Kazdin, 1977, p.143). Further, this drift may not be reflected in the interobserver reliability assessment if the observers work together consistently and communicate their behavioral definitions to one another (O'Leary & Kent, 1973). In this investigation, the observers worked separately to minimize the probability of observers having the opportunity to develop similar variations of the original behavioral definitions and reliability assessment were conducted periodically.

5. Complexity of the coding system. The complexity of the coding system can refer to the number of different response categories in the system, the number of behaviors that are scored within the system on any given occasion, subjects varying in the behaviors exhibited and varying complexity across time (Kazdin, 1977). Mash and McElwee (1974) demonstrated that observers utilizing a four category observation system had a higher level of accuracy than observers utilizing an eight category system. Therefore, an observation system with a minimum number of behavior categories was used in this investigation. The number of different behaviors that were to be scored was also limited as interobserver agreement declines as the diversity of the behaviors scored increases (Taplin & Reid, 1973). Finally, interobserver reliability was calculated across all phases of the study and across all subjects to control for variation of behavior across time and diversity of behavior across subjects.

Procedures for Data Collection

Data was collected on each subject in this study two to three times a week in both the treatment setting at the conclusion of the play session, and in the following classroom free play setting. On each treatment day five minutes of continuous data were collected in the treatment room and five minutes in the classroom for each child. Each five minute sampling period consisted of 60 five-second intervals. During the five minute observation sessions observers recorded every occurrence of codable behavior exhibited by the child. The observers listened to a pre-recorded tape which marked the five second intervals with a beep and a number which corresponded to the data sheet indicating which interval to code. Ear phones were used to minimize the obtrusiveness of the observers.

Treatment of the Observational Data

The data recorded for each five minute period were tallied to yield a total number of occurrences for each behavior category. From this tally the percentage of social behavior and talk was determined by dividing the number of occurrences by the number of boxes recorded. The start rate and answer rate were determined by dividing the number of occurrences of the behavior by the number of minutes observed. The average interaction length was computed by counting the number of intervals where interaction was continued and dividing by the number of

times positive interaction occurred. Finally, the percentage of continued interactions was computed by tallying the number of intervals where interaction was continued from one interval to another without break and dividing by the total number of intervals.

Upon completion of the above procedures, the data were transcribed onto graphs and subjected to visual analysis (Parsonson & Baer, 1978). The stability of the baseline scores, the amount of overlap between scores, the variability of scores across and within phases and changes in trend direction, trend stability and level were considered in the analysis of the plotted data. The relationship of these factors and their impact on the conclusions made concerning the experimental interventions will be discussed during the presentation of the data in Chapter Five.

Visual inspection of the data was considered to be an appropriate measure of the treatment efficacy in this investigation. The use of visual analysis to make inferences concerning treatment effects lowers the probability of type I errors or "erroneously rejecting the null hypothesis" (Parsonson & Baer, 1978, p.111). With visual inspection of data the effects are apparent to the eye. The lowered probability of Type I errors results in an increase in the probability of Type II errors (Baer, 1977). Type II errors, or "accepting the null hypothesis when it should have been rejected" (Parsonson & Baer, 1978, p.112) occur because small effects may be difficult to detect through visual inspection and are likely to be dismissed as no effect (Baer, 1977).

Teacher Ranking/Rating

The initial subject selection measure utilized in this intervention, as previously described in this chapter, required the teacher to list all of the students in the class in order corresponding to their level of interaction (see Figure 5). In this ranking system (Greenwood, et al., 1978) the lowest ranked child indicates that in the teacher's opinion, that child would demonstrate the lowest rate of interactive behavior while the highest ranked child would demonstrate the highest rate of interaction (see Figure 5). This teacher ranking was completed twice by the teacher and aide with a test-retest reliability of .90 obtained over a four week period. The ranking was also completed again at the conclusion of the treatment as a post measure.

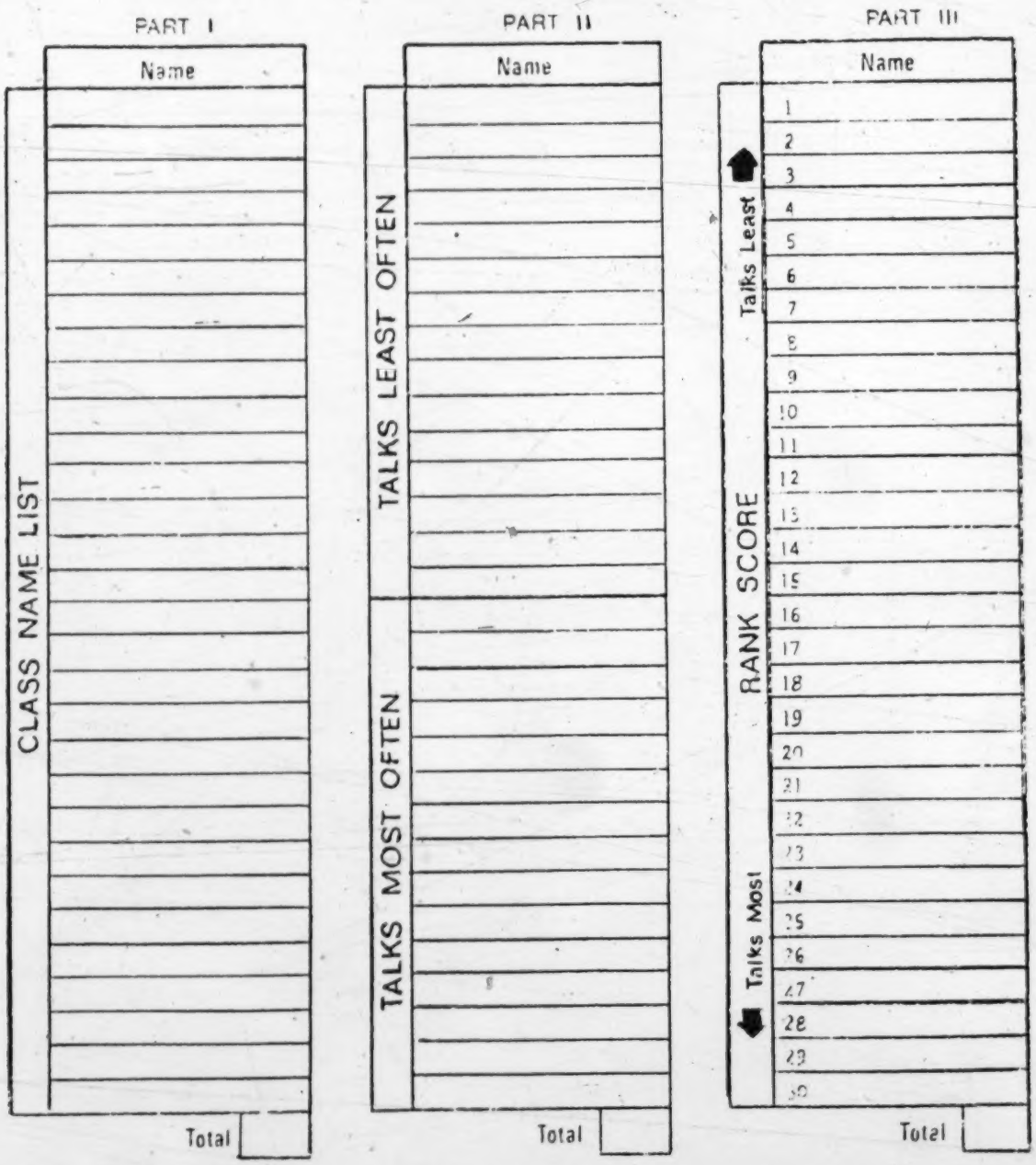
This measure was used in this investigation as an initial screen for children with social behavior problems. There is some evidence to suggest that teachers can fairly accurately identify children with social problems. Greenwood et al. (1977) found that teacher rankings of children's interaction frequency were fairly accurate in selecting high and low students on the continuum.

After rank ordering the children, the teacher also completed a Teacher Rating Scale on each of the children (see Figure 6). This teacher ranking scale consisted of eighteen items on two alternate forms that examined various areas of social interaction skill. These items

Figure 5

STUDENT RANKING FORM

Teacher _____ Class _____ Date _____



NOTE Totals listed in each part must be equal

Figure 6

TEACHERS RATING SCALE

CHILD'S NAME: _____ SCHOOL: _____

TEACHER: _____ DATE: _____

INSTRUCTIONS:

Please read each statement below and circle the corresponding number that is most descriptive of the child's behavior. The numbers 1 through 5 represent a continuous range from not descriptive or true to very descriptive of the child. A rating of 3 indicates that the child sometimes does and sometimes does not display the behavior being rated.

- - - -

Figure 6 (continued)

Part B

Date: _____

		Not Descriptive		Moderately Descriptive		Very Descriptive
10.	Responds to statements or actions by peers	1	2	3	4	5
11.	Is sought after as a play partner	1	2	3	4	5
12.	Approaches a group of children and attempts to become involved	1	2	3	4	5
13.	Seldom needs coaxing to play with other children	1	2	3	4	5
14.	Engages in social exchanges with other children	1	2	3	4	5
15.	Invites a peer to play	1	2	3	4	5
16.	Plays cooperatively with others	1	2	3	4	5
17.	Shares toys and other materials	1	2	3	4	5
18.	Shares laughter with classmates	1	2	3	4	5

Scale Score _____/ 9 = _____ Average Scale Score

were rated on a five point Likert System. A score of one was treated as a false description, three as moderately descriptive and five rates as very descriptive. Each child's average score was determined on each form. The rating scale was completed twice by the teacher and aide with half the class rated on form A on the first rating and the other half on form B. On the second rating four weeks later each half of the class was rated on the form they were not previously rated on and at an alternate form test-retest reliability of .91 was obtained. This social skills measure was again completed at the conclusion of the treatment as a post measure.

Teacher ratings provide global information in the assessment of social skills and teachers can make fairly accurate discriminations (Gresham, 1981). Teacher ratings have also been validated against behavioral observations as well as sociometric data (Greenwood, et al., 1977).

Sociometric Measures

Two sociometric measures were utilized in this study, peer ratings and partial peer nominations. The peer rating scale involved all of the children in the classroom rating each classmate according to how much they liked to "play with" a peer by pointing to a happy face Likert type scale and examining a picture of the peer. A very happy face received a score of five and indicated that the child would like to play with the peer very much, a medium face received a score of three and indicated

that they sort of liked to play with the peer and a sad face received a score of one and indicated that they did not like to play with that peer very much. There were a total of five faces in a continuous scale to choose from. Each child's score was an average rating of scores received from the entire class. This type of sociometric method provides an indication of each child's perception of every classmate and indicates the general acceptance of any particular child.

Peer ratings yield reliable scores. Oden and Asher (1977) reported a test-retest reliability of .82 on a play with rating scale with third and fourth grade children. Asher, Singleton, Tinsley and Hymel (1977) reported a stability coefficient of .81 on a play with rating scale with preschool children. Rating scales also have good concurrent validity. Hartup, Glazer and Charlesworth (1967) reported positive correlations between rates of positive interaction and sociometric acceptance. Gresham and Nagle (1980) reported similar results. Peer ratings have also shown concurrent validation with teacher ratings of social behavior (Gresham, 1981).

The second sociometric measure of peer nomination required each child in the class to select three peers according to two criterion: who they would like to "play with, and who they would not like to play with" while examining pictures of all of their classmates mounted on a board. This measure provides an index of how many friends a child may have as well as who is actively rejected by the children in the class. Peer nominations have somewhat lower reliability rates than peer ratings. Bonney (1943) reported test-retest scores of .67 to .84 over

one year period. Oden and Asher (1977) reported a .62 coefficient for a "best friend" peer nomination and Asher, et al. (1977) a .56 for a peer nomination procedure with preschool children.

Both sociometric instruments were administered as pre- and post-measures. They were not used more frequently as they may become reactive if used on a regular basis (Gresham, 1981).

E. Treatment

Observer Training

Approximately four hours of observer training were carried out prior to baseline data collection. The first session involved becoming familiar with the written materials. The observers spent time learning the behavior categories, studying rules to code the behaviors, and coding hypothetical examples of social interaction.

In the next session the observers simultaneously coded videotaped samples of children in free play. Following the observations disagreements were discussed.

The last two sessions were spent in the classroom doing live observations of children engaged in free play activities. At the end of the sessions the criterion of 80 percent agreement on the social interaction categories had been reached. At that point observers moved on to collecting the actual data. In addition, throughout the study the

observers received weekly feedback about their observation consistency in the form of percentage agreement across subjects.

Intervention

After the completion of the subject selection procedure the training of the peer helpers was initiated. The peer training followed a lesson format that relied on role play with a puppet or another child as the major teaching tactic. In phase I these lessons were designed to provide the peer helper with positive practice in facilitating social interaction with their withdrawn peers through initiations, prompting, modeling and reinforcement. Four lessons were provided for each peer helper, 12 to 15 minutes in length. The first three lessons involved the experimenter, puppet, and the peer helper and were designed to teach the peer helper to prompt and praise desired behaviors. The last lesson provided the peer helper with an opportunity to practice the necessary behaviors with another child from the class. The objectives for the lessons are displayed in Figure 7.

After the completion of the first four lessons of peer training phase I treatment with adult direction was initiated. The target child and trained peer helper were taken to a small treatment room down the hall from the classroom. Selected play materials (Figure 8) for each session were available and were arranged so they were easily accessible to the children. Half of the materials involved primary activities that involved concrete interaction with objects. The other half involved

Figure 7

Lesson 1 The peer helper will prompt shares, and persist in getting the puppet to share.

Lesson 2 The peer helper will prompt puppet to share and assist during role play and will persist in prompting and praise puppet for sharing and assisting.

Lesson 3 The peer helper will prompt and praise shares and assists with another student. Lesson complete when peer helper elicits three shares or assists from peer and praises.

Figure 8

Play Session Materials

playing ball -- chair, box, ball, hockey sticks

puppets -- puppets, stage

blocks -- large and small blocks, box

bowling -- bowling pins and ball

drawing -- paper, crayons, table

balloons -- balloons, box

bean bags -- bean bags, target, box

wagons - wagon and objects to fit in

puzzles -- puzzles, table

house -- broom, table, bed, dishes

dressup -- dress up clothes

doctor -- doctor kit, cot

cars -- toy cars, gas station, roadway

store -- toy cash register, toy money, store items

games -- children's card games, bingo

animals -- plastic animals, barn, tractor

space ship -- chairs, box, blocks

railroad -- train set and accessories

complex activities requiring fantasy or role playing skills. The activities were not intended to be a sequence of activities but rather to provide choice and variety. The activities were similar or identical to those in the class and were intended to provide the children with the opportunity to practice social interaction across a number of different types of activities. Each target child participated in twelve 15 minute play sessions over a four week period for phase I. This play session was broken into 10 minutes of treatment followed by 5 minutes of observation.

During each play session in phase I the peer helper prompted and praised social behaviors of the target child such as sharing and assisting. Adult supervision in the form of prompting and praising were provided as necessary to stimulate interaction between the target child and peer helper. The number of prompts and praises required by the adult were recorded and gradually faded according to a schedule (see Figure 9). The idea behind prompting was to get the children started in a play activity and to get the target child to use shares and assists if the trained peer was unable to elicit those responses. Prompting and praise were kept to an absolute minimum to allow the trained peer to try to initiate social interaction. Only when this failed was adult intervention used.

After phase I intervention was complete additional lessons were provided for the peer helpers prior to the commencement of phase II. These lessons were designed to enable the peer helper to now teach the target child to socially initiate. The peer helpers continued to prompt

Figure 9

Prompting and Reinforcement Schedule

Record prompting and reinforcement required to maintain interaction during first two sessions and average the results. Begin schedule at level nearest to that required during first two sessions. Fade to next lowest level after two treatment sessions.

30 seconds

45 seconds

1 minute

2 minutes

5 minutes

10 minutes

and praise but the focus of the treatment sessions was to now involve the target child in practicing positive social initiations. The objectives for the additional lessons are displayed in Figure 10.

The format for phase II intervention was identical to that in phase I.

F. Internal and External Validity

Internal Validity

The internal validity of an experiment is the extent to which extraneous variables have been controlled by the researcher. If extraneous variables are not controlled, it cannot be determined whether observed changes are due to the experimental treatment or to an extraneous variable. Extraneous variables refer to aspects of the situation that occur while the experimental treatment is in progress; these aspects are irrelevant to the treatment, but because they occur concomitantly with the treatment, they can become confounded with it (Borg & Gall, 1983). A discussion of the possible threats to the internal validity of this research design, and the steps taken to control these influences follows.

1. History. Opportunity for other events to occur besides the experimental treatment are provided when experimental treatments extend over a period of time. The probability that extraneous events causing changes that may confound intervention effects

Figure 10

Objectives for peer helper lessons

Phase II

Lesson 4 The peer helper will learn to prompt social initiations and persist in getting puppet to initiate.

Lesson 5 The peer helper will prompt initiations and praise puppet for initiating.

increases. The use of multiple baseline across subjects (Baer et al., 1968) helps eliminate the plausibility of historical threats to validity as experimental control is repeatedly demonstrated through the sequential introduction of the intervention across subjects (Kratochwill, 1978).

2. Maturation. Biological or psychological processes within the student are likely to occur while the experimental treatment is in progress (Borg & Gall, 1983). The influence of this extraneous variable can be minimized by the examination of the baseline data for trends (Parsonson & Baer, 1978). In the multiple baseline design, the baseline period is extended for some subjects and analysis for changes in trend. Also, for socially withdrawn children, it has been demonstrated that without intervention, low levels of social interaction form relatively stable patterns over time (Peck et al., 1978; Strain et al., 1977).

3. Testing. When pretests and posttests are administered in an experiment to measure change, subjects may demonstrate improvement simply as an effect of their experience with the pretest (Borg & Gall, 1983). Steps were taken to minimize the reactive effects of the observational methodology such as not interacting with the children during observation and not beginning observation for 5 to 10 minutes after the session started.

4. Instrumentation. A change in measured behavior from pretest to posttest or during the course of the intervention may occur due to the nature of the measuring instruments. The use of unreliable

measuring devices can pose a threat to the internal validity of a study particularly with observational data (Kratochwill, 1978). Caution was exercised with the observational methodology to attempt to control factors such as observer drift and bias. The sociometric methods used in this investigation had demonstrated reliability in previously published studies. The teacher ratings and rankings were administered twice over four weeks in an attempt to establish reliability levels for those instruments.

5. Statistical Regression. Whenever a test-retest procedure is used to assess change as an effect of the experimental treatment, the possibility exists that statistical regression can account for observed gains in learning particularity with groups receiving extreme scores (Borg & Gall, 1983). The repeated measures over an extended period time during baseline a multiple baseline design permits examination of the data to check for this confounding variable.

6. Multiple Intervention Interference. In this investigation it was necessary to introduce the two treatments in the same order to all subjects. As a result, it was not possible to determine the pure effects of the second phase of intervention as the observed effect may be due to some combination of the two phases of intervention.

External Validity

External validity is the extent to which the findings of an experiment can be applied to other settings, subjects and agents (Borg & Gall, 1983). One of the major criticisms directed at single subject designs is that they have low external validity and generally the findings cannot be generalized beyond the subjects in the investigation (Borg & Gall, 1983). In order to improve the generality of the results obtained in this investigation, the direct replication of the experiments was conducted across different subjects. The subjects involved closely resembled each other in terms of their scores on five social skill measures, however they were quite heterogeneous in respect to other characteristics. This heterogeneity is typical in the target population of withdrawn children and the evaluation of treatment results across the subjects increases the confidence with which the effects of the treatments can be generalized to the population of interest. However, this investigation is also limited in that the sample was not randomly selected. The extent to which personological variables interact with treatment effects may also be a concern. The instructional format may have interacted with student characteristics such as sex and school placement.

In addition to population validity, the ecological validity of the study must be examined. Ecological validity concerns the extent to which the results of the experiment can be generalized from the set of environmental conditions created by the experimenter to other

environmental conditions (Borg & Gall, 1983). A discussion of the threats to ecological validity follows.

1. Explicit description of the experimental treatment. The experimental treatment should be described in sufficient detail so that other researchers can reproduce it.
2. Multiple-treatment interference. As discussed previously, the order of the presentation of the two phases of intervention poses a threat to the validity of this investigation. The multiple intervention also makes it difficult to determine the generalizability of the findings.
3. Hawthorne Effect. The special attention given to the subjects in an experiment may cause a behavior change rather than the experimental treatment itself (Borg & Gall, 1983). However, the extended baseline level of responding for several of the subjects indicated that individual attention in being taken to a separate room with a peer did not produce behavior change.
4. Novelty and Disruption Effects. An experimental treatment may be effective simply because it is different from the instruction subjects normally receive. If this occurs the results have low generalizability as the treatment's effectiveness is likely to decrease as the novelty wears off. Disruption effects occur when treatments disrupt the normal routine. In this investigation the treatment effects extended over time minimizing the effect these factors should have on the validity of the design.

5. Experimenter Effects. An experimental treatment may be effective due to the experimenter who administers it. The treatment effects, then, cannot be generalized to conditions in which a different person is the experimenter. This could be a concern in this investigation as the same investigator conducted the peer training and intervention sessions with the target children. It is possible that the effects of these treatments may not generalize across different experimenters. Invalidity due to experimenter effects may also be the result of observer bias, as the data reported may not accurately reflect the treatment effects. However, precautions were taken to minimize the threat of observer bias to the validity of this study as previously discussed.

6. Interaction of history and treatment effects. This occurs when the results cannot be generalized beyond the time period in which the time when the experiment was conducted. In this investigation treatment effects were replicated across subjects over time, minimizing the possibility that a particular historical event could be responsible for the treatment effect.

7. Measurement of the Dependent Variable. The generalizability of the experiment may be limited by the particular pretest and posttest use to measure change (Borg & Gall, 1983). In this investigation the change was measured by a variety of different types of measures increasing the probability that the finding would generalize to other instruments.

8. Interaction of Time of Measurement and Treatment Effects. The administration of outcome measures at different points in time may result in different treatment effects. In this investigation multiple behavioral observations were conducted at the conclusion of the treatment and at a period four weeks later. This demonstrates the presence of the treatment effect over numerous measurement occasions.

CHAPTER 4

RESULTS

The purpose of this study was to investigate the effects of two phases of peer mediated social skills intervention on the social behavior of socially withdrawn kindergarten children. The major dependent variable for the evaluation of the two phases of treatment was a behavior observation procedure coded on the Social Interaction Code Form. The results follow.

Behavioral Assessment

The behavioral observations yielded a percentage of positive social behavior in the treatment setting for each treatment day. This behavioral data was recorded on line graphs and is depicted in Figure 11. Visual inspection and analysis of the data included examination of level stability and changes in level within and between conditions, trend direction utilizing a split middle method, trend stability, changes in trend within and between conditions and overlap between conditions for each individual Baseline Phase.

In Figure 11, baseline data for all three subjects is shown for the treatment setting. All three subjects demonstrate a zero celeration trend during the baseline phase with a variable data path. The baseline trend stability was calculated (highest value x stability criterion .10 = acceptable stability range) resulting in an acceptable stability range

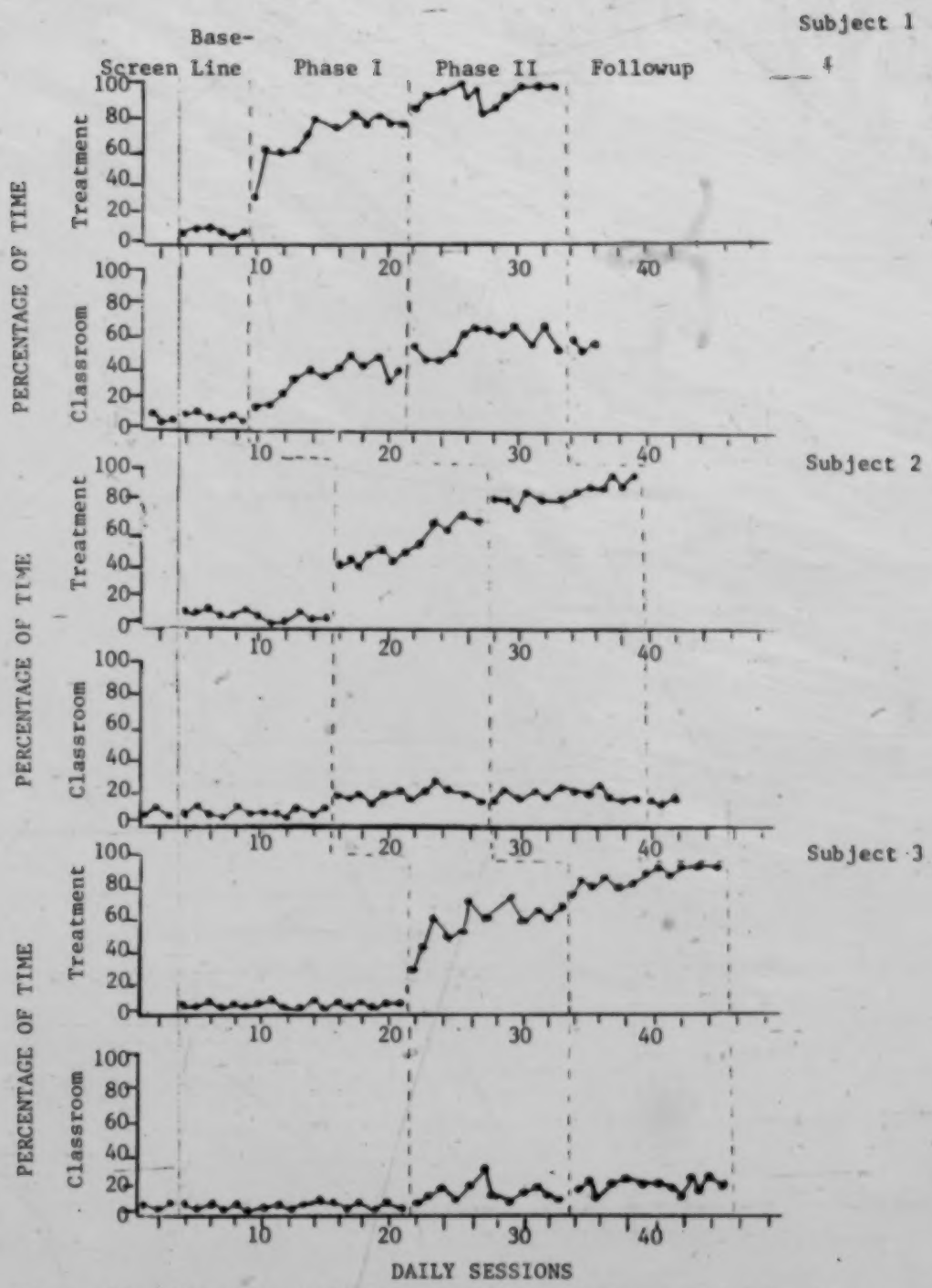


Figure 11. Percentage of time spent in positive social behavior in treatment and classroom generalization settings for all three subjects.

of .7 to .8 allowing for the variability. As a result, all the baseline trends were calculated as variable. However, all three subjects exhibited behavioral rates consistently below eight percent positive social behavior which constitutes a very low, stable rate of social interaction. In addition, baseline levels were variable with a range of 3.3 to 8 percent for Subject 1, 1.7 to 6.7 percent for Subject 2 and 0 to 6.7 percent for Subject 3.

An examination of the specific variability of each child's percentage of social behavior did not suggest any systematic occurrence. The data paths for each child were consistently variable within the range previously described. At a period of six daily sessions over two weeks the baseline observations of subject one, two and three seemed relatively stable, so the intervention was introduced. The introduction of phase 1 for subject 1 did not appear to have any effect on the baselines of subjects 2 and 3 and subsequently the introduction of phase 1 for subject 2 did not have an effect on the baseline of subject 3.

Examination of the baseline data across subjects demonstrates experimental control. In each case the stagger of the initiation of treatment phase I for each subject produced no change in the baseline of the subjects not yet introduced to treatment.

Treatment Phase 1

The data presented in Figure 11, show a positive change in the percentage of social behavior with the introduction of phase 1 across

all three subjects. The introduction of peer mediated intervention resulted in an improving trend that was variable for subject 3 and stable for subjects 1 and 2. The variability in subject two's performance was due to one initial lower data points and several random higher points. All three subjects in fact had lower initial data points perhaps the result of hesitancy to socially interact at the introduction onset of the intervention. Subject two's random high points may have been due to strong interest in particular play materials noted during observations. The data for all three subjects was variable in level as a result of the large increases in level change noted during phase 1. In addition, no overlap was noted for any of the subjects from baseline to phase 1 and the change in level between phases was 25 percent for subjects one and three and 35 percent for subject two. Overall, the phase I data had an improving trend, increased level and no overlap indicated that the treatment was very effective in improving rates of positive social behavior. Each time phase I treatment was introduced to a subject's data series it produced a substantial increase in the percentage of positive social behavior. The initiation of phase I treatment produced a clear positive effect.

Treatment Phase II

The data also indicates a positive change in the percentage of social behavior with the introduction of phase II for all three subjects. The introduction of the second phase of peer mediated

treatment resulted in a stable improving trend for all three subjects. However, for two of these subjects the improving trend was decelerating as there was a ceiling effect on the percentage of social behavior, they had both obtained 100 percent positive social behavior during the treatment sessions. All three subjects demonstrated level stability in phase II with the changes in level from phase I to phase II ranging from five to seven percent. Subjects one and three had eight percent overlap between phase I and phase II while subject two had none. It is difficult to say whether or not the increase in phase II was a continuation of the upward trend demonstrated during the first treatment phase even though the level of behavior exhibited was higher in phase II than that observed in phase I. Given the overlap of the two phases for two of the subjects and the contamination between phases no definitive statements concerning the treatment effects of phase II can be made other than increased stabilization of behavior and increased levels.

In addition to investigating the effects of the two phases of intervention on the percentage of positive social behavior a number of additional research questions were posed. The questions and results pertaining to them follow.

1. Generalization. At what level will the social behaviors generalize to the classroom free play setting following the treatment sessions?

Baseline Phase

During the baseline phase in the classroom generalization setting a zero celeration trend with a variable data path was observed for all subjects. As with the percentage of positive social behavior in the treatment setting, the percentage of positive social behavior in the classroom setting, the trend stability was calculated (highest value x stability criterion .10 = acceptable stability range). The highest value in the baseline phase ranged from five to seven percent resulting in a stability range of .5 and .7 for the subjects. This allowed for very little variability and the baseline trends calculated were all variable. However, all three subjects exhibited percentages of positive social behavior consistently below seven percent which constitutes a stable rate of responding. In addition, all three subjects demonstrated variable level stability with a range of 3.3 to 5 percent for subject one, 0 to 6.7 percent for subject 2 and 3.3 to 6.7 percent for subject three. As with the treatment baseline examination of the data demonstrates experimental control. In each case the stagger of the initiation of the treatment phase I produced no change in the baselines of the subjects not yet introduced to treatment.

Treatment Phase I

The data in Figure 11 show a positive change in the percentage of social behavior exhibited in the classroom generalization setting for

all three subjects. However, the resulting trends were quite variable. Subject one had an improving trend as did subject two. Subject three displayed an initial improving trend followed by cyclical variability. All three subjects had variable level stability in phase I with a range of 13.3 to 46.7 for subject 1, 11.7 to 40 for subject 2 and 11.7 to 33.3 for subject 3. The change in level from baseline to phase I was an increase of 10 percent for subject one, an increase of eight percent for subject two and an increase of seven percent for subject 3. Subjects one and two had no overlap between baseline and phase I, while subject three had an overlap of eight percent. Overall, phase I resulted in increased levels of performance across all subjects with considerable variability. In each instance the introduction of phase I treatment resulted in an increase in the percentage of positive social behavior in the target data path.

Treatment Phase II

The data also indicates a positive change in the percentage of social behavior observed in the classroom setting with the initiation of phase II intervention for subjects one and three. The introduction of the second phase of treatment resulted in a positive upward improving trend for both subjects one and three. Subject 2 also displayed a positive upward trend that improved and then declined. All three subjects had variable data paths and level stability with a range of 41.7 to 68.3 for subject 1, 11.7 to 26.7 for subject two and 15-35 for

subject three. Subject one evidenced a 13.3 percent positive change in level from phase I to phase II, subject two no level change, and subject 3 an increase of 8.3 percent. The overlap between the two phases was substantial with 25 percent for subject one, 92 percent for subject 2 and 83 percent for subject 3.

There was considerable variability of behavior across phase I and phase II in the classroom generalization setting. This variability may be due to availability of play partners in the classroom and play activities chosen in free play by the target children. Both phases produced higher rates of behavior than the baseline phase, however, the high percentage of overlap across phase I and II allows no definitive statements concerning the treatment effects of one treatment over another can be made. Subject one had less overlap but the increase in behavior in phase II may have been a continuation of the upward trend demonstrated in the first treatment phase.

2. Maintenance. At what level will the socially withdrawn children maintain positive social behaviors at a one-month interval following the conclusion of the intervention?

Followup data from Figure 11 show a slight decrease in the social behavior of subject one from phase II to followup. With followup a stable, zero celeration trend resulted. During the first day of followup a 13 percent higher rate of social behavior was observed than

on the last day of phase II with an overlap of 100 percent between phase II and followup.

Followup data for subject two show little change in the percentage of social behavior from phase II to followup. With followup, a stable, zero celeration trend resulted. During the first day of followup three percent less social behavior was observed than on the last day of phase II with an overlap of 100 percent between phase II and followup.

Followup data from Figure 11 show a slight decrease in the social behavior of subject three from phase II to followup. With followup a stable, zero celeration trend resulted. During followup an eight percent lower rate of social behavior was observed than on the last day of phase II with an overlap of 100 percent.

Followup data for two of the subjects showed the percentage of social behavior to be slightly lower than phase II over levels of responding. However, followup data was substantially higher than baseline levels of responding for all three subjects. In addition, subject one's performance when compared to normative data (Hops et al., 1978; Greenwood, et al., 1978) fell within average range. Unfortunately subjects two and three were still performing at withdrawn levels as indicated by these norms.

3. Sociometrics. Will the socially delayed children receive increased scores on peer rating and nomination procedures following intervention?

The "play with" peer rating scores the target children received from all classmates were averaged for each child, resulting in a pretraining and posttraining mean. The means for each subject are reported in Table 4. In addition, the means and standard deviations for the class on the peer rating at pretest and posttest are reported in Table 5.

Table 4

Means of Individual Subjects on the Peer Rating at Pretest and Posttest

	Assessment Interval	
Subject	Pretest	Posttest
1	3.3	3.95
2	1.5	2.8
3	3.25	3.7

All three subjects demonstrated increases in peer ratings from pretest to posttest. Subject one received a peer rating score above the class average at posttest, subject two remained well below the class mean on the posttest and subject three received a rating score within one standard deviation of the class mean on the posttest.

The peer nomination procedure produced scores for positive nominations (who would you like to play with) and negative nominations (who would you not like to play with). The number of positive and

Table 5

Means and Standard Deviations of the Classroom on the Sociometric Measure at Pretest and Posttest

	Assessment Interval	
	Pretest	Posttest
Mean	3.93	3.83
Standard Deviation	.66	.47

negative nominations received by each subject at pretest and posttest are given in Table 6.

Only two subjects received a greater number of positive nominations at posttest than at pretest. The gains ranged from 1 to 2 nominations. One subject did not demonstrate any gains on the positive nomination. All three subjects had fewer negative nominations at posttest from pretests. They demonstrated decreases from 6 to 1 nominations.

4. Teacher Perceptions. Will the socially withdrawn subjects show increases in teacher rankings and ratings at posttest?

The teacher ratings each child received from the teacher on all eighteen items were averaged for each child resulting in a pretraining

Table 6

Number of Positive and Negative Nominations Received by Each Subject at Pretest and Posttest

Subject		Assessment Interval	
		Pretest	Posttest
1	positive	0 (0)*	2 (3.3)
	negative	7 (11.7)	2 (3.3)
2	positive	0 (0)	0 (0)
	negative	13 (21.7)	8 (13.3)
3	positive	0 (0)	1 (1.7)
	negative	7 (11.7)	6 (10)

*Percentage of nominations in brackets

and posttraining mean. The means for each subject are reported in Table 7. In addition, the means and standard deviations for the class on the teacher rating are reported in Table 8.

All three subjects demonstrated increases in teacher ratings from pretest to posttest. The gains ranged from 1.2 (subject 1) to .3 (subject 2). Subject one received a teacher rating score at the class average at posttest, subjects two and three still remained more than one standard deviation below the class average at posttest on the teacher ratings.

Table 7

Means of Individual Subjects on the Teacher Ratings at Pretest and Posttest

	Assessment Interval	
Subject	Pretest	Posttest
1	2.3	3.5
2	1.5	1.8
3	1.9	2.1

Table 8

Means and Standard Deviations of Classroom on Teacher Rating at Pretest and Posttest

	Assessment Interval	
	Pretest	Posttest
Class mean	3.68	3.5
standard deviation	.98	1.3

3. Specific Social Behaviors. How will the two phases of intervention effect the specific behavior of initiations, responses, percentage of intervals in continued interaction, average length of interaction and percentage of talk behavior?

A. Initiations

The behavioral observations yielded two start rates per minute for each treatment session, one in the treatment setting and one in the classroom setting. The start rate was determined by counting the number of initiations made during the observation period and dividing it by the number of minutes observed. This data was recorded on line graphs and is depicted in Figure 12. Visual inspection of the data was conducted and the results follow.

Baseline Phase--Treatment Setting

In Figure 12 baseline data for subjects one, two and three is shown. The trend lines for the three subjects differ greatly. Subject two has a positive improving trend, subject one had a declining trend and subject three a zero celeration trend. All three subjects have variable level stability during baseline with a range of 0 to .4 for subject one and three, and 0 to .6 for subject two. The data paths during baseline were characterized by variability. The staggered baselines demonstrate experimental control over the initiation rates.

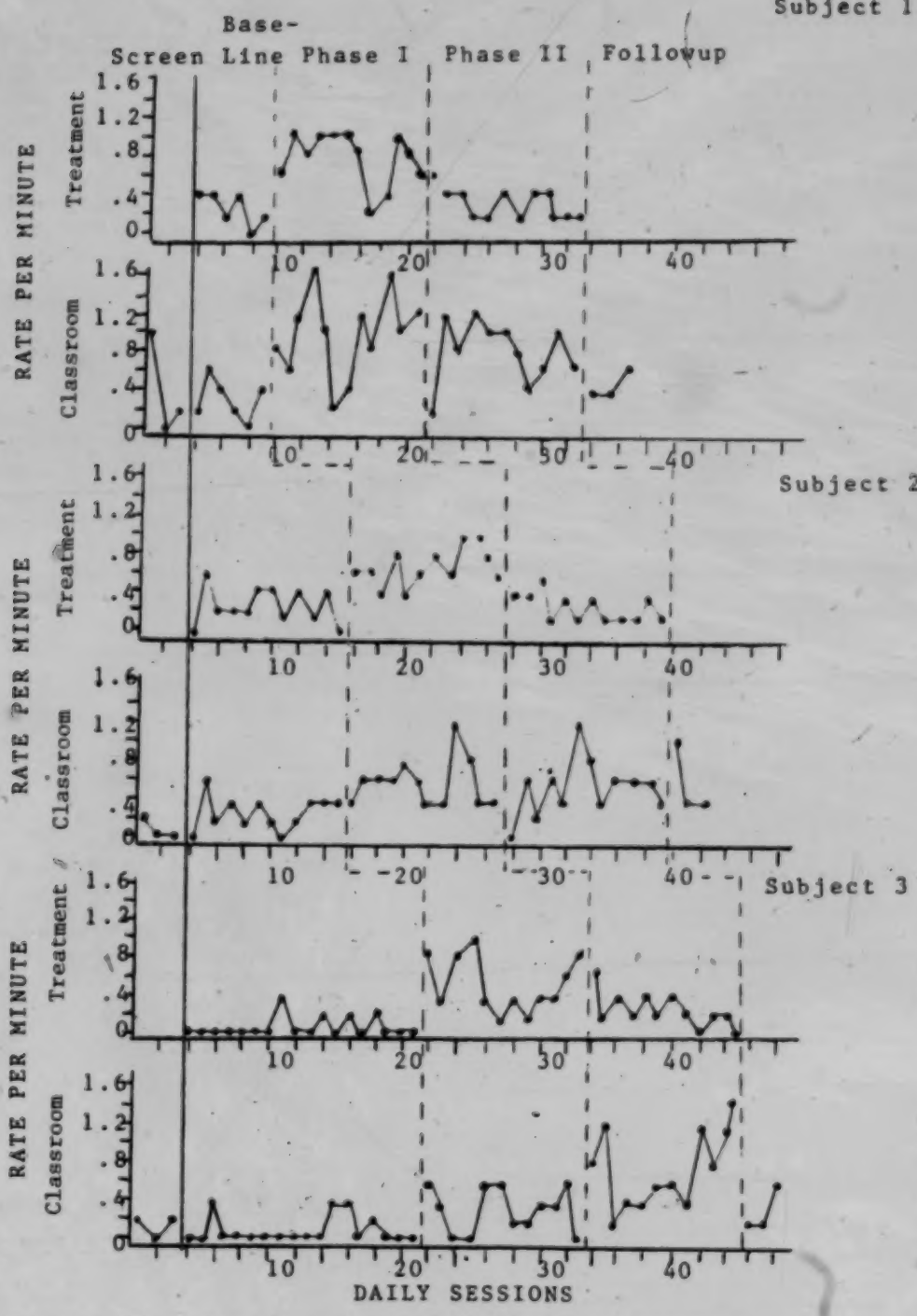


Figure 12. Start rate per minute in treatment and classroom generalization sessions across all three subjects.

In each case the stagger of the introduction of phase I treatment produced no change in the baselines of the subjects not yet introduced to treatment.

Treatment Phase I--Treatment Setting

The introduction of phase I treatment resulted in a positive change in the start rates for all three subjects. The initiation of the first phase of treatment produced a declining trend with a variable data that initially improves the declines then improves again for subject one. Subject two demonstrated a variable but definite improving trend while subject three evidenced an extremely variable trend with again a number of different data paths. All three subjects had variable level stability in phase I and the level range was from .2 to 1.0 for subject one and three and .4 to 1.0 for subject two. The change in level from baseline phase to phase I was an increase of .4 starts per minute for subject one, an increase of .6 starts per minute for subject two, and an increase of .8 starts per minute for subject three. The two phrases overlap by 25 percent for subject one and 58 percent for subjects two and three. In each instance the introduction of phase I treatment resulted in an increase in the initiation rate in the target data path. Clearly the training had a positive effect.

Treatment Phase II--Treatment Setting

The data in Figure 12 show a negative change in the start rate per minute with the introduction of phase two intervention. All three subjects demonstrated a negative downward trend with variable data paths and level stability. Level ranges were 0 to .2 for subject 1, 0 to .6 for subject 2 and subject 3. The change in level between the two phases was a decrease of 1.0 for subject one, a decrease of .6 for subject two and a decrease of .4 for subject three. The percentage of overlap between phase 1 and phase 2 was zero for subjects one and two and 83 for subject three. Phase II was marked by a downward trend with the introduction of treatment. This downward trend may have been the result of a higher number of continued interactions producing fewer opportunities to initiate interactions. This will be discussed further in this chapter.

Baseline Phase--Classroom Setting

In Figure 12 baseline data for subjects one, two and three are shown for the classroom setting. Subject two demonstrate a linear trend which is slightly upward, subject one has a slightly downward linear declining trend and subject three a zero celeration trend. All three subjects have variable data paths and level stability during baseline with a range of 0 to .6 for all subjects. Examination of the baseline data across subjects demonstrates experimental control. In each case

the initiation of the first phase of treatment produced no change in the subjects not yet introduced to treatment.

Treatment Phase I--Classroom Setting

The introduction of phase I treatment resulted in a positive change in start rates for all three subjects. The initiation of the first phase of treatment resulted in negative downward trends for subjects two and three. Subject one had an improving trend however, as with subjects two and three there were a number of different data paths within this trend. Level stability was variable for all three subjects and the range .2 to 1.6 for subject 1, .4 to 1.2 for subject two, and .2 to 1.0 for subject three. The change in level from baseline to phase one was an increase of .4 starts per minute for subject one, no change for subject two and .2 starts per minute for subject three. There was a great deal of overlap between the two phases. Subject one had an overlap of 58 percent, subject two 75 percent and subject three 50 percent. Phase I did result in an increase in the start rate for all three subjects, however the data was characterized by variability.

Treatment Phase II--Classroom Setting

The data in Figure 12 show different changes for different subjects in the start rate per minute with the introduction of phase II intervention. Subject one demonstrated a negative change with a

downward trend. Subject two demonstrated little change with an improving trend with a variable data path. Subject three demonstrated a positive change with an improving trend. All three subjects had variable level stability and the level range was .2 to 1.2 for subject one, 0 to 1.2 for subject two and .2 to 1.0 for subject three. The change in level from phase I to phase II was a decrease of 1.0 for subject one, a decrease of .4 for subject two and a decrease of .8 for subject three. The percentage of overlap between the two phases was 75 percent for subject one, 83 percent for subject two and 50 percent for subject three. The data paths and trends were variable across all three subjects with phase II data overlapping considerably with phase I.

Followup--Classroom Setting

All three subjects demonstrated a negative change during followup observations from phase II. Subjects one and three had an improving trend while subject two had a declining trend. The data paths for all three subjects were variable. All three subjects also had variable level stability with a level range of .4 to .6 starts per minute for subject one, .4 to 1.0 for subject two and .8 to 1.0 for subject three. The change in level from phase II to followup was a decrease of .2 for subject one, an increase of .6 for subject two and an increase of .8 for subject 3. The percentage of overlap was 100 percent for all three subjects from phase II to followup. However, the followup data was at a slightly higher level than that shown for baseline phase.

B. Responses

The behavioral observations yielded two answer rates per minute for each treatment session, one in the treatment setting and one in the classroom setting. The answer rate was determined by counting the number of responses made during the observation period and dividing it by the number of minutes observed. These data were recorded on line graphs and are shown in Figure 13. Visual inspection of the data was conducted and the results follow.

Baseline Phase--Treatment Setting

In Figure 13 baseline data for subjects one, two and three is shown for the treatment setting. The trend lines are quite different for each subject. Subject one had an improving trend, subject two a declining trend with a variety of data paths within, and subject 3 a variable zero celeration trend. Level stability was variable for all three subjects with the range 0 to .6 for subjects one and two and 0 to .4 for subject three. Examination of the baseline data demonstrates experimental control of the treatment over the answer rate. In each case the stagger of the initiation of the treatment phase I produced no change in the baselines of the subjects not yet introduced to treatment.

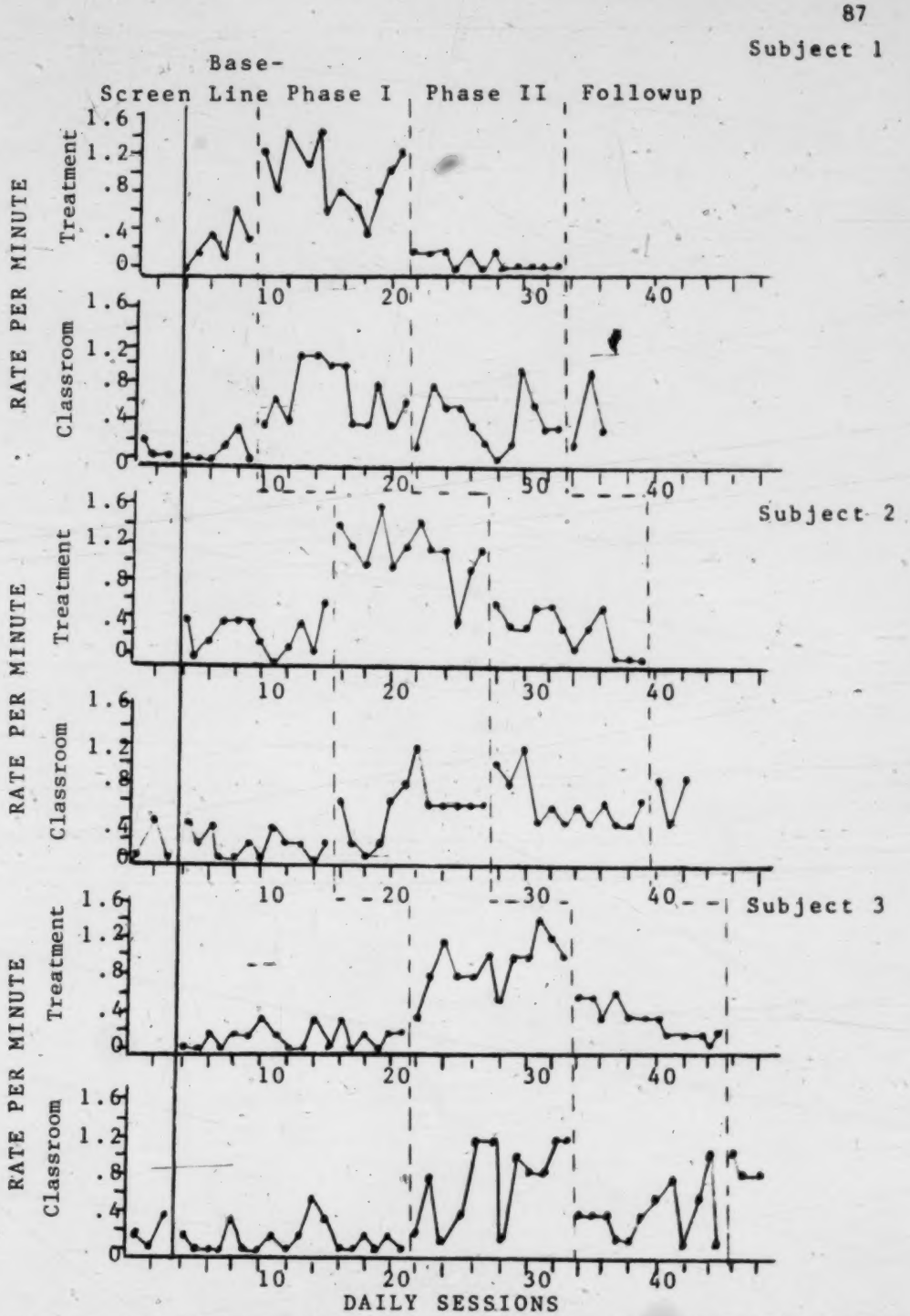


Figure 13. Answer rate per minute in treatment and classroom generalization sessions across all three subjects.

Treatment Phase I--Treatment Setting

The introduction of phase I treatment resulted in a positive change in the answer rates for all three subjects. The initiation of the first phase of treatment produced a declining trend for subject one, a zero celeration trend for subject two and an improving trend for subject three. However, the data paths were variable. The level stability was variable for all subjects in phase I and the level range was from .4 to 1.2 for subject one and three and .4 to 1.6 for subject two. The change in level from baseline to phase I was an increase of .8 answers per minute for subject one and two and an increase of .2 answers per minute for subject three. The percentage of overlap between the baseline and phase I was 25 percent for subject one, no overlap for subject two and eight percent overlap for subject three. In each instance the introduction of phase I treatment resulted in an increase in the answer rate in the target data path.

Treatment Phase II--Treatment Setting

The data in Figure 13 show a negative change in the answer rate per minute with the introduction of phase II intervention. The initiation of the second phase of treatment resulted in a variable declining trend with variable data paths for all three subjects. The level stability was variable for all three subjects and the level range from 0 to .2 for subject one and 0 to .6 for subject two and three. The change in level

from phase I to phase II was a decrease of 1.0 answers per minute for subject one, a decrease of .6 for subject two and a decrease of .4 for subject three. The percentage of overlap between the two phases was zero percent for subjects one and two and 58 percent for subject three. As with the decline in the start rate per minute, the decline in the answer rate per minute may be the result of an increased percentage of continued interactions which decreases the opportunities to initiate and respond to initial initiations in interactions.

Baseline Phase--Classroom Setting

In Figure 13 baseline data for subjects one, two and three are shown for the classroom setting. Subject one had an improving trend, subject two a declining tend and subject three an improving trend with all three subjects having variable data paths. The level stability was variable for all three subjects and the level range was 0 to .4 for subject one, and two and 0 to .6 for subject three. Examination of the baseline data across subjects demonstrates experimental control. In each case the stagger of the initiation of the first treatemnt phase produced no change in the baseline of the subjects not yet introduced to treatment.

Treatment Phase I--Classroom Setting

The data show a positive change in the answer rate per minute with the introduction of phase II intervention. The initiation of the first phase of treatment resulted in an improving trend with a variety of data paths for subject two and three and a declining trend for subject one. The level stability for phase I was variable for all three subjects with a range of .4 to 1.2 for subject one, 0 to 1.2 for subject two and .2 to 1.2 for subject three. The change in level from baseline to phase I was an increase of .4 for subject one and two and an increase of .2 for subject three. The overlap between baseline and phase I was 42 percent for subject one, 25 percent for subject two and 33 percent for subject three. As with the treatment baseline examination of the data demonstrates experimental control. In each case the stagger of the initiation of the phase I treatment produced no change in the baselines of the subjects not yet introduced to treatment.

Treatment Phase II--Classroom Setting

The data show a decrease in the answer rate per minute for all subjects with the introduction of phase II intervention. The initiation of the second phase of treatment resulted in a declining trend for subjects one and two, and a decelerating, improving trend for subject three. The level stability for phase II was variable for all subjects and the range was 0 to .8 for subject one, .4 to 1.2 for subject two and

.2 to 1.0 for subject three. The change in level from phase I to phase II was a decrease of .4 answers per minute for subject one, an increase of .4 for subject two and a decrease of .8 for subject three. The overlap between phase I and phase II was 66 percent for subject one and three and 100 percent for subject two. Given the overlap of the two phases for all subjects no definitive statements concerning the treatment effects of phase II on the answer rate can be made.

Followup--Classroom setting

All three subjects demonstrated little or no change during followup observations from phase II intervention. Subjects one and two had a zero celeration trend during followup and subject three a declining trend. All three subjects had variable data paths. The level stability was variable across all three subjects and the range .2 to 1.0 for subject one, .4 to .8 for subject two and .8 to 1.0 for subject three. The change in level from phase II to followup was a decline of .2 for subject one, an increase of .2 for subject two and an increase of .8 for subject three. The percentage of overlap between phase II and followup was 100 percent for all three subjects.

C. Talk Behavior

The behavioral observations yielded two percentages of talk behavior for each treatment session, one in the treatment setting and

one in the classroom setting. The percentage of talk behavior was determined by counting the number of talk behaviors observed and dividing it by the number of intervals observed. The data was recorded on line graphs and is shown in Figure 14. Visual inspection of the data was conducted and the results follow.

Baseline Phase--Treatment Setting

In Figure 14 baseline data for subjects one, two and three is shown. For subjects one and two the baseline trend is variable with zero celeration. Subject three had a posited slightly improving trend. The level stability was variable across all three subjects and the range was 1.6 to 6.7 for subject one, 3.3 to 5 for subject two and 0 to 3 for subject three. In each case the introduction of the first phase of treatment had no effect on the baseline series of the subjects who had not yet received treatement.

Treatment Phase I--Treatment Setting

The data show a positive change in the percentage of talk behavior with the introduction of phase I intervention. The initiation of the first phase of treatment resulted in an improving trend with variable data paths for all three subjects. The level stability was variable for the three subjects and the level range was 10 to 78.3 for subject one, 8.3 to 30 for subject two and 6.7 to 15 for subject three. The change

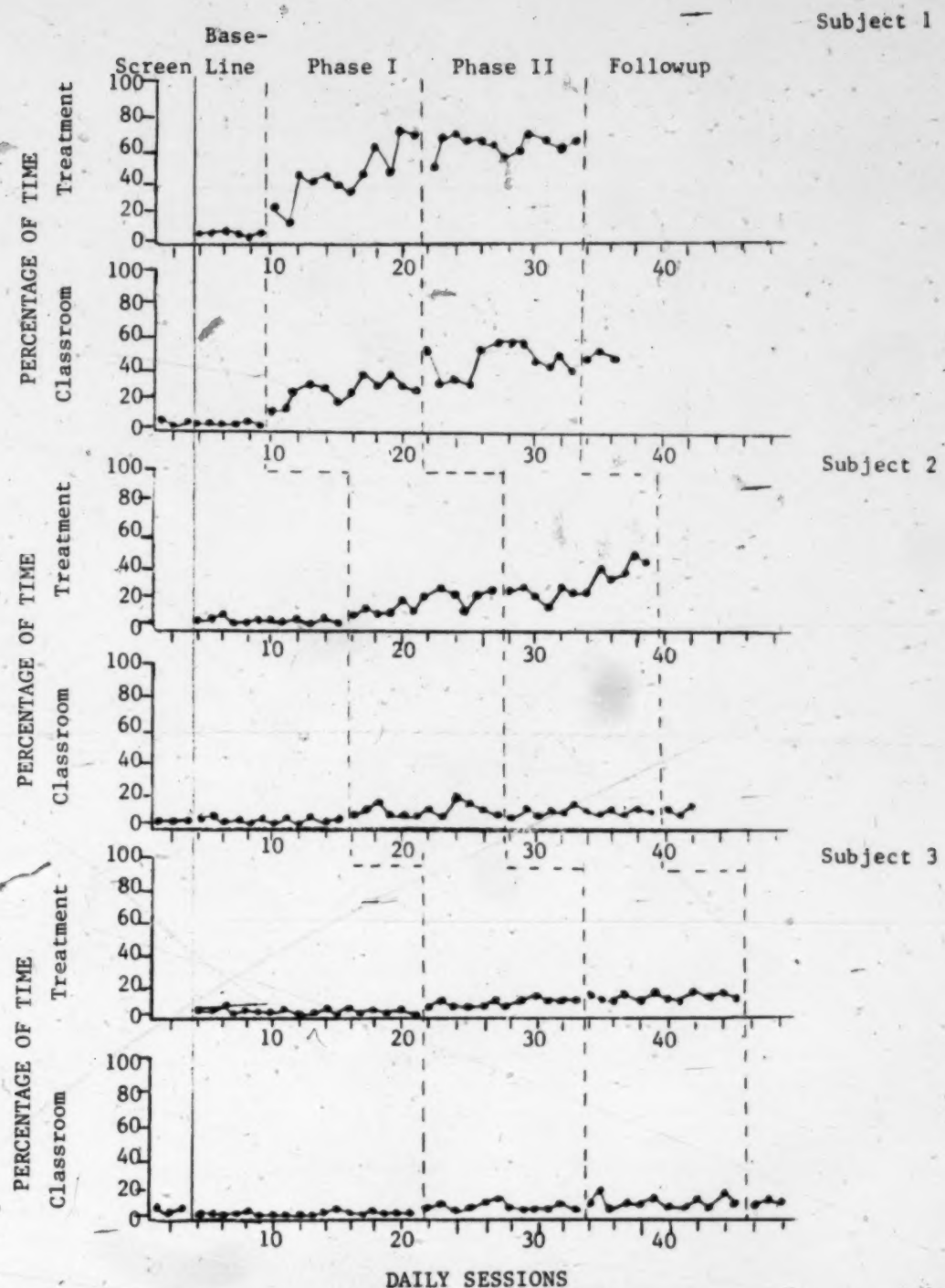


Figure 14. Percentage of time spent in talk behavior in treatment and classroom generalization settings for all three subjects.

in level from baseline to phase I was an increase of 17 percent for subject one, and increase of 7 percent for subject two and an increase of 8 percent for subject three. There was no overlap between baseline and phase I for any of the subjects. Each time phase I treatment was introduced to a subject's data series it produced a positive increase in the percentage of time spent in talk behavior. The introduction of phase I treatment produced a clear effect.

Treatment Phase II--Treatment Setting

The data show a positive change in the percentage of talk behavior with the introduction of phase II intervention for the subjects. The initiation of the second phase of treatment resulted in a positive, improving, trend for subjects two and three. Subject one on the other hand demonstrated a declining trend with a variable data path. The level stability for phase II was variable across all three subjects and the level range was 53.3 to 78.3 for subject one, 13.3 to 58.3 for subject two and 11.7 to 18.3 for subject three. The change in level from phase I to phase II was a decrease of 23 percent talk behavior for subject one, a decrease of two percent for subject two and an increase of seven percent for subject three. The percentage of overlap from phase I to phase II was 100 percent for subject one, 42 percent for subject two and 58 percent for subject three. Given the overlap between phase I and phase II no definitive statements can be made concerning the effects of phase II.

Baseline Phase--Classroom Setting

The baseline trend for subjects one and two was variable with zero celeration. Subject three demonstrated a slightly improving trend during baseline. The level stability was variable across all three subjects with a range of 3.3 to 5 percent for subject one, 1.7 to 6.7 percent for subject two and 0 to 3.3 percent for subject three. In each case the introduction of the first phase of treatment had no effect on following data series that had yet not been introduced to treatment demonstrating experimental control.

Treatment Phase I--Classroom Setting

The introduction of phase I intervention produced a positive change in the percentage of talk behavior observed in the classroom setting. The initiation of the first phase of intervention resulted in a variable in phase I for all three subjects with a level range of 13.3 to 41.7 percent for subject 1, 5 to 23.3 percent for subject two and 1.7 to 15 percent for subject three. The change in level from baseline to phase I was an increase of 15 percent for subject one, an increase of 1.7 percent for subject two and an increase of five percent for subject three. There was no overlap between baseline and phase I for subjects one and three and there was an overlap of 58 percent for subject two. Each time phase I treatment was introduced to a data series it produced

a positive change in the percentage of time spent in talk behavior. The initiation of phase I treatment produced a positive effect.

Treatment Phase II--Classroom Setting

The introduction of phase II intervention produced a positive change across subjects. All three subjects had an improving trend. For subject three this trend was accelerating but for subjects one and two it was decelerating.

The level stability was varied for subjects two and three and variable for subject one. The level range was 48.3 to 55 percent for subject one, 8.3 to 11.7 percent for subject two and 13.3 to 15 percent for subject three. The change in level from phase I to phase II was an increase of 13 percent for subject one, no change for subject two and a decrease of 2 percent for subject three. The percentage of overlap for all three subjects was 100 percent. Given the overlap no definitive statements concerning the treatment effects of phase II can be made.

Followup--Classroom Setting

The followup data showed little or no change from phase II data for all the subjects. Followup produced a variable, decelerating improving trend for all three subjects. The level was stable across all three subjects with a range of 48.3 to 55 for subject one, 8.3 to 11.7 for subject two and 13.3 to 15 for subject three. The change in level from

phase II to followup was an increase of 13.3 percent for subject one, no change for subject two, and a decrease of two percent for subject three. There was a 100 percent overlap between phase II and followup for all three subjects.

D. Continued Interaction

On each treatment day, two percentages of continued interaction were obtained for each subject, one in the treatment setting and one in the classroom setting. The percentage of continued interaction was calculated by counting the number of intervals in which the target child was observed to have continued an interaction from the initial interval where a response or initiation occurred. The results were graphed and are shown in Figure 15 and visual inspection of the data conducted. The results follow.

Baseline Phase--Treatment Setting

During the baseline phase the trend for all three subjects was variable with zero celeration. The level was variable across subjects the range 0 to 3.3 percent for subject one and two and 0 to 1.7 for subject three. Examination of the baseline data across subjects shows that the stagger of the initiation of the first treatment phase to the first baseline series produced no change in following baseline series

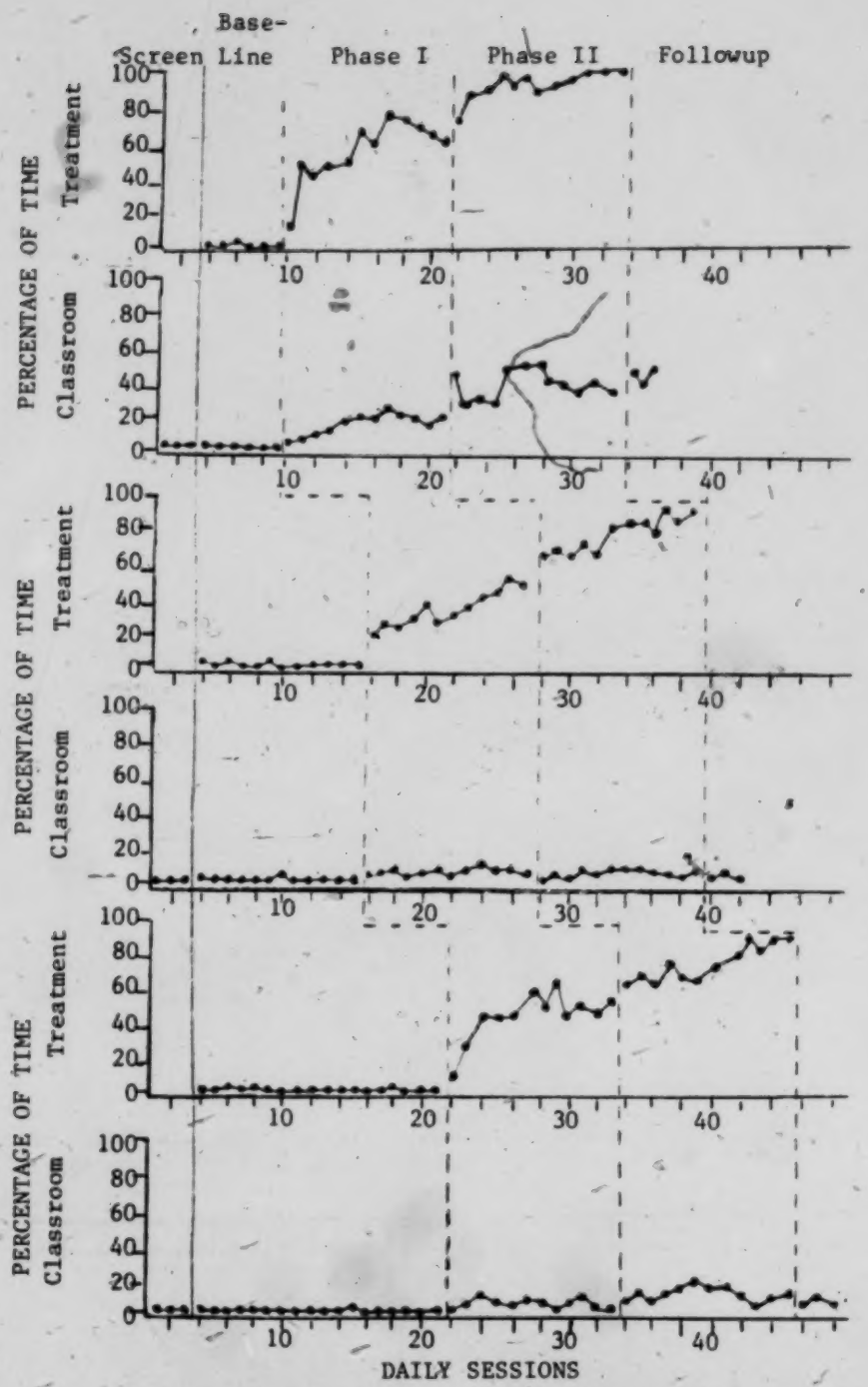


Figure 15. Percentage of time spent in continued interaction in treatment and classroom generalization settings for all three subjects.

not yet introduced to treatment. This demonstrates experimental control.

Treatment Phase I--Treatment Setting

The introduction of phase I intervention produced a positive change in the percentage of continued interactions for all three subjects. The initiation of the first phase of intervention resulted in a positive upward trend for all three subjects. However, the data paths were variable. The level stability was also variable for all three subjects with a range of 15 to 78.3 percent for subject one, 25 to 58.3 percent for subject two, and 16.7 to 61.7 percent for subject three. The change in level from baseline to phase I was an increase of 15 percent for subject one, an increase of 25 percent for subject two and an increase of 16.7 percent for subject three. There was no overlap between the baseline and phase I for any of the subjects. Each time phase I treatment was introduced to a data series it produced a substantial increase in the percentage of time spent in continued interaction. The initiation of phase I treatment produced a clear positive effect.

Treatment Phase II - Treatment Setting

The introduction of phase II treatment produced a positive change in the percentage of continued interactions following phase I treatment. The second phase of intervention resulted in a stable, accelerating,

improving trend for subjects two and three and a stable, decelerating, improving trend for subject one. The difference between accelerating trends of subjects two land three and the decelerating trend of subject one is the fact that subject one had reached the maximum percentage of continued interactions during observations producing a ceiling effect and a decelerating trend. Subjects two and three also differ from subject one as their level stability in phase II is variable while subject two's is stable. The level range is 76.7 to99 percent for subject one, 70 to 99 percent for subject two and 68.3 to 100 percent for subject two and 68.3 to 100 percent for subject three. The change in level from phase I to phase II was an increase of 13.4 percent for subject one, an increase of 14.9 percent for subject two and an increase of 6.6 percent for subject three. The percentage of overlap between phase I and phase II was eight percent for subjects one and three and no overlap for subject two. In each case the percentage of time spent in continued interaction increased substantially with the introduction of phase II treatment clearly demonstrating the positive effect of the treatment. In addition, with the multiple baseline stagger subsequent baseline series which had not yet been introduced to the second phase remained unaffected, demonstrating experimental control.

Baseline Phase--Classroom Setting

During the baseline phase in the classroom setting all three subjects exhibited a stable zero celeration trend. The level stability

was also stable for all three subjects with a range of 0 to 1.7 for subjects one and two and zero for subject one. Examination of the baseline data across subjects shows that each time phase I treatment was introduced to a baseline series no effect was noted on the remaining baseline series not yet introduced to treatment demonstrating experimental control.

Treatment Phase--Classroom Setting

The introduction of phase I treatment produced a positive change in the percentage of interactions for all three subjects. The initiation of the first phase of intervention resulted in an improving trend for subjects one and two, and a declining trend for subject three. However all three subjects had variable data paths. The level stability was variable for all three subjects in phase I and the range 3.3 to 33.3 percent for subject one, 1.7 to 18.3 percent for subject two and 0 to 21.7 percent for subject three. The change in level from baseline to phase I was an increase of 3.3 percent for subject one, an increase of five percent for subject two and no change for subject three. The percentage of overlap was zero for subject one, eight percent for subject two and three percent for subject three. In each case the introduction of phase I treatment resulted in a positive increase in the percentage of time spent in continued interaction.

Treatment Phase II--Classroom Setting

The introduction phase II treatment at the conclusion of phase I produced varying results for different subjects. For subject one the initiation of the second phase of treatment resulted in a variable, positive change with an upward trend. For subject two, little change occurred with a slightly improving trend. For subject three the change was positive, however the linear trend line was very variable with many improving and declining paths within. The level stability of phase II was variable for all subjects and the range 35 to 56.7 percent for subject one, 1.7 to 11.7 percent for subject two and 3.3 to 26.7 percent for subject three. The percentage of overlap between phase I and phase II was zero for subject one, 92 percent for subject two and 75 percent for subject three.

Followup--Classroom Setting

The followup data indicate a negative change from phase II to followup observations. Subjects one and two demonstrate a variable, decelerating improving trend, subject three a variable improving trend. The level stability was variable for subjects three and two and stable for subject one, 1.7 to 5 percent for subject two and 3.3 to 11.7 percent for subject three. The change in level from phase II to followup was of one percent for subject one, a decrease of 6.7 percent for subject two, and a decrease of 15 percent for subject three. The

percentage of overlap between phase II and followup was 100 percent for all three subjects.

E. Average Length of Interaction

The behavioral observations yielded two average length of interaction scores, one in the treatment setting and one in the classroom setting, for each treatment session. The average length was determined by counting the number of intervals in each continuous interaction, adding it up and dividing by the number of intervals. These data were recorded on line graphs as are presented in Figure 16. Visual inspection and analysis of the data was completed and the results follow.

Baseline Phase--Treatment Setting

During baseline the trend for all three subjects was stable with zero celeration. The level was also stable with a range of 1.0 to 1.7 for subject one, 1.0 to 1.5 for subject two and 0 to 1.5 for subject three. Examination of the baseline data across subjects shows that in each case the initiation of the first phase of treatment for subjects one and two produced no change in the baseline of subsequent subjects data series not yet exposed to phase I treatment. This demonstrates experimental control.

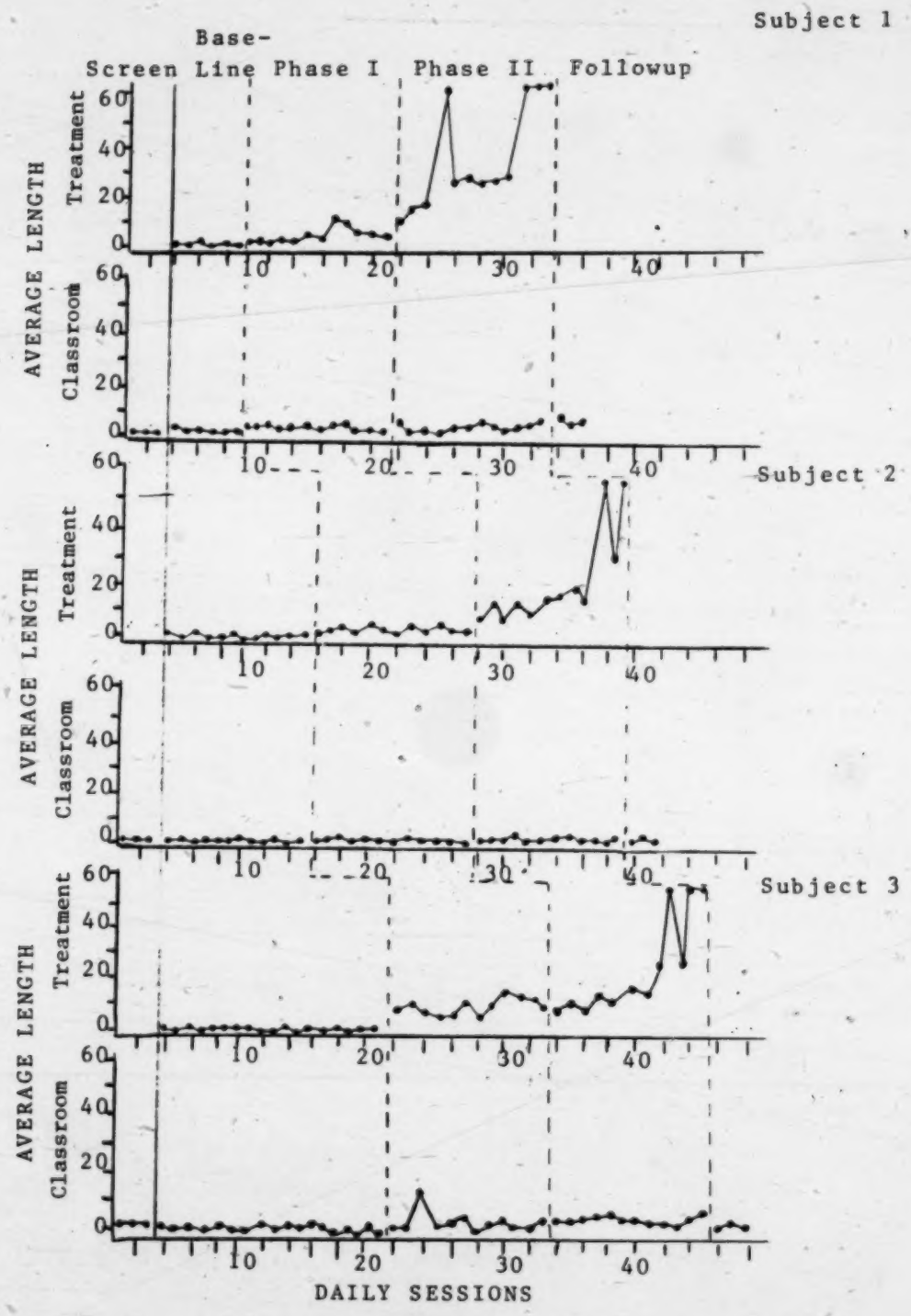


Figure 16. Average length of interaction in treatment and classroom generalization sessions across all three subjects.

Treatment Phase I--Treatment Setting

With the introduction of phase I a positive change occurred for all three subjects. The initiation of the first phase of treatment resulted in a variable improving trend for subjects one, two and three. The level stability was also variable for all three subjects with a range of 2.0 to 12.8 for subject one, 2.5 to 5.6 for subject two and 2.7 to 17.8 for subject three. The change in level from baseline to phase I was an increase of .7 for subject one, an increase of 1.5 for subject two and an increase of 1.7 for subject three. There was no overlap between baseline and phase I for the three subjects. Each time phase I treatment was introduced to a subject's data series it produced an increase in the average length of interaction it clearly had a positive effect.

Treatment Phase II--Treatment Setting

The introduction of phase II treatment at the conclusion of phase I resulted in a positive change for all three subjects. Subjects one, two and three demonstrated an improving trend with variable data paths with the initiaiton of the second phase of intervention. All three subjects had variable level stability with a range of 12.5 to 60 for subject one, 9.5 to 60 for subject two, and 7.8 to 60 for subject three. The level of change from phase I to phase II was an increase of 6.7 for subject one, an increase of 4.8 for subject two and an increase of 1.5 for

subject three. The percentage of overlap between phase one and phase two was eight percent for subject three, and zero for subjects two and one. The introduction of phase II intervention produced a positive change in the average length of interaction and had a positive effect.

Baseline Phase--Classroom Setting

The baseline data indicate that subjects one and two had a stable, zero celeration trend while subject three had a variable slightly improving trend. Subjects one and two had a stable level and subject three variable level stability. The level range was 1.0 to 2.0 for subject one, 1.0 to 1.5 for subject two and 0 to 1.3 for subject three. The baseline data show that in each case the stagger of the initiation of treatment phase I for each subject produced no change in the baselines of the following subjects not yet introduced to treatment. This lag demonstrates experimental control of the treatment over behavior.

Treatment Phase I--Classroom Setting

The introduction of phase I treatment produced a very slight positive change in the average length of interaction for subjects one and two and little or no change for subject three. The initiation of the first phase of intervention resulted in a variable improving trend for subjects one and two and a variable slightly declining trend for

subject three. This was the result of one unusually high score on the third day of treatment. The level stability was variable for all three subjects with a range of 1.3 to 3.7 for subject one, 1.1 to 3.0 for subject two, and 1.0 to 14 for subject three. The change in level from baseline to phase I was an increase of .3 for subject one, an increase of .5 for subject two and a decrease of 1.0 for subject three. The percentage of overlap between baseline and phase 1 was zero for subject one, 50 percent for subject two, and 25 percent for subject three. Give the percentage of overlap between the two phases of the subjects it is difficult to determine a clear effect of the treatment on the average length of interaction in the classroom setting. However, for subject one an increase was observed indicating a positive effect.

Treatment Phase II--Classroom Setting

The introduction of phase II treatment at the conclusion of phase I produced very positive changes in the average interaction length for subject one, and positive by lesser changes for subjects two and three. The initiation of the second phase of intervention resulted in a variable, accelerating, improving trend for subjects one and two and a variable declining trend for subject three. The level stability of phase two was variable for all three subjects with a range of 2.5 to 7.8 for subject one, 1.2 to three for subject two, and 1.2 to 5.3 for subject three. The change in level from phase I to phase II was an increase of 5.3 for subject one, a decrease of .2 for subject two and an

increase of .6 for subject three. The percentage of overlap between phase I and phase II was 25 percent for subject one, 100 percent for subject two and 50 percent for subject three. Given the percentage of overlap between the two phases no clear statements can be made regarding the effect of the treatment.

Followup--Classroom Setting

All three subjects experienced a slight decline in the average length of interaction during followup. The trend was variable, declining for subject one and variable improving for subjects two and three. The level stability was variable for all three subjects with a range of 5.0 to 9.5 for subject one, 1.1 to 1.5 for subject two and 1.5 to 2.4 for subject three. The change in level from phase II to followup was an increase of 3.5 for subject one, a decrease of .9 for subject two and a decrease of 3.1 for subject three. The percentage of overlap was 66 percent for subject one and two and 100 percent for subject three. All three subjects were performing at a higher level than baseline rates at followup.

CHAPTER FIVE

DISCUSSION

Evaluation of Effects

General visual analysis of the graphic data revealed that there was a marked increase in the percentage of positive social behavior with the introduction of phase I treatment, and again with the introduction of phase II treatment, an effect that was replicated across all three subjects. The data paths in baseline were characterized by some variability but became stable with phase II. The trend was upwards for both phases with a ceiling effect occurring for one subject. The increase may or may not have been a continuation of the upward trend demonstrated during the first treatment phase however the level of behavior exhibited in phase II was higher than that observed in phase I with little overlap.

The positive change in the percentage of positive social behavior generalized to the classroom freeplay setting but at a much lower level than that observed in the treatment setting. There was a great deal of overlap between phase I and phase II for all subjects making it difficult to distinguish the effects. For all subjects phase I and phase II levels of positive social behavior were higher than levels of behavior observed during baseline. For subject one the generalized level of responding was well within average range.

The followup data on the percentage of positive social behavior showed levels of behavior comparable to that exhibited during phase II but at slightly lower levels than the final data points in the phase. In addition, followup data was at higher levels than behavior observed during baseline.

The start and answer rates, for all three subjects, demonstrated an increase during phase I followed by a subsequent decrease in phase II in the treatment setting. As previously discussed, this was due to increased continued interactions resulting in fewer opportunities to initiate or respond to initiations in interactions.

The percentage of talk behavior also increased in both phase I and phase II. As with the percentage of positive social behavior, the percentage of talk behavior generalized to the classroom but at a lower level than that observed in the treatment setting.

The percentage of continued interactions also showed improvement in both phase I and phase II with the classroom generalization level lower than the treatment level. Although, phase II data was higher than phase I the data was not conclusive as there was overlap between the two phases.

The average length of interaction in the treatment setting showed improvement in phase I and again with the introduction of phase II treatment. In the classroom setting one subject demonstrated substantially longer interactions in phase II than in phase I. For the other two subjects this improvement was not demonstrated as there was considerable overlap between phases and a considerable degree of

variability. However, the treatment levels of responding were higher than baseline levels.

All three subjects evidenced gains in teacher ratings, with subject one receiving an average rating at posttest. All three subjects improved on the peer rating averages with subject one receiving an average score and subject three approaching average. On the peer nominations all three subjects showed improvement. Subject one received more positive nominations and fewer negative nominations. Subject two received no positive nominations but fewer negative nominations. Subject three received one additional positive nomination and one less negative nomination. Finally, only subject one improved on the posttest teacher ranking.

Generalization and Maintenance of Effects

The inevitable goal of the treatment in this intervention was transfer of the behavior performance under treatment conditions to free play conditions. Sulzer-Azaroff and Mayer (1977) state that the mere occurrence of behavior change does not mean change will persist and be generalized to other situations but that the environment must be structured to maintain the behavior change. However, procedures to train for generalization were included as previously discussed and an assumption was made that once the child learned some basic social behaviors and began to engage in social interactions, that the naturally occurring consequences of behavior would be strong enough to take over

and maintain newly acquired behaviors. For subject one this indeed occurred and for subjects two and three it occurred to a much lesser degree. For the two subjects, for whom generalization did occur, but at a much lower level the structure of the environment may indeed need to be changed to maintain the behavior change in the new setting. When social behavior exhibited during followup or in generalization does not approach acceptable levels it may be due to the fact that the social environment did not provide potential or responsive partners. When the children return to the classroom, partners may not be available as socially competent children tend not to interact with them when socially skilled children are available (Strain, Kerr and Raglund, 1979). Not only do withdrawn children require specific skill training but peers' behavior toward and perceptions of target children must also become a focus. Strain and Fox (1981) indicated that the generalization and maintenance of improved peer interaction skills may also be inhibited by well developed friendship networks between children. It may be difficult for a child to break into existing interaction patterns.

Another major contributing factor of poor generalization may be the negative social history that peers may have had with the target children. The target children may have a) had awkward and disruptive attempts to enter play groups, b) withdrawn even more from peer contact after unskilled attempts to play failed, and c) extinguished the approach behaviors of peers because of their lack of responsiveness (Strain and Fox, 1971). All of these circumstances create a negative

history in which generalization and maintenance of learned skills may be difficult.

Differential Response to Treatment

The data indicates that all three subjects responded in a fairly similar manner to the two phases of treatment in the treatment setting. However, differential response to treatment was observed in the classroom setting.

Possible factors that might have contributed to differential treatment effects but which were not identified or controlled for were the following:

1. specific speech and language skills/deficits
2. motor coordination skills/deficits
3. specific skills/knowledge regarding play activities
4. levels of anxiety experienced in peer interaction and
5. feelings of self worth as a friend.

Another complication is that differential treatment effects may be as related to initial levels of the five factors above as to differential gains or improvements in these factors during the treatment and maintenance periods.

In addition, the basis for the social skill deficit or social withdrawal may have varied from subject to subject. The withdrawal may have been due to: a skill deficit, a performance deficit, or self control deficit (Gresham, 1981). Children with skill deficits do not

have the necessary skills to interact appropriately with peers. Children who possess performance deficits may have the social skill for effective interaction, but do not perform skills because of response-inhibiting anxiety or low motivation. Children who exhibit self control deficits may lack adequate behavioral controls to inhibit impulsive, disruptive, or aggressive social behavior. The skill, performance and self control conceptualizations of social skill suggest that a technique may be differentially effective with children with different types of problems.

The results obtained in this investigation may have been influenced by a number of factors that contributed to the differential effects. Subject one's level of generalized positive social behavior was at an average level for his age group and was substantially higher than the generalized behavior of subjects two and three. This high level of performance may be due to the fact that subject one may have possessed a performance deficit and had the social skill for effective interaction, but did not perform the skills because of response inhibiting anxiety or low motivation. Given the positive practice of performing the skills in the treatment setting subject one was readily able to apply the skills in the classroom. Or perhaps, given subject one's high intelligence quotient, he was able to learn the skills quickly and apply them in the classroom setting. In addition, subject one's articulation difficulties did not seriously hamper his ability to communicate and he was able to interact appropriately at a verbal level.

Subject two evidenced gains in percentage of social behavior in the classroom generalization setting. It is possible subject two possessed a skill deficit and did not have the necessary skills to interact appropriately with peers and a self control deficit evidenced in lacking adequate behavioral controls to inhibit impulsive, disruptive and aggressive social behavior. As a result subject two may have had more difficulty learning and performing the social skills in the classroom. The behavior exhibited due to poor self control may have contributed to low levels of postitive social behvaior due to aggression, disruption of interactions, etc. In addition, subject two had great difficulty in articulating and communicating clearly which may have contributed to his inability to interact with other children at a verbal level.

Subject three also evidenced gains in percentage of social behavior in the classroom generalization setting but at a much lower level than subject one. It is possible subject two possessed a skill deficit and did not have the necessary skills to interact appropriately with peers and a performance deficit due to anxiety and low motivation. Given these two deficits it would be more difficult for subject two to learn the new skills required and apply them in the classroom due to high levels of anxiety and low motivation to interact. It is also possible subject two had a very low level of self concept.

Overall, the skill, performance and self control conceptualizations of social skill coupled with individual factors such as speech and language, motor skill, anxiety and feelings of self worth may have been responsible for the differential responses of the subjects to the

treatment. Several hypothesis of how these factors may have influenced the performance of the subjects has been discussed that inhibited attempts to interact. In addition subject three moved very slowly in the classroom and often appeared lethargic. This may have caused his peers to pass him by as a partner for play activities or prevented him from participating in active games.

Peer Mediated Treatment

The two phases of treatment in this investigation utilized trained peers to facilitate the acquisition of social skills. Previous research has demonstrated the efficacy of having a trained peer initiate and maintain social play with a socially delayed child, model, reinforce and tutor social skills. However, it was not clearly determined in these studies whether or not increases in interaction rates generalized. For subject one in this investigation the peer mediated treatments were successful at improving the rates of positive social behavior in the classroom. Subject one approximated average rates of positive social behavior and did develop reciprocal friendships with classroom peers.

The peer mediated techniques were less successful for subjects two and three. Even at the conclusion of intervention, the rates of positive social behavior were still within withdrawn range. There are a number of hypothesis why this lack of treatment gain occurred in terms of the peer trainer involvement. First, perhaps the peers paired with subjects two and three were less skilled than the peer paired with

subject one. Although the three trained peers received the same training and reached the same criterion level in training they may not have reached the same competency level in terms of initiating, maintaining and reinforcing peers for social interaction. Second, the matches between the peer trainer and the target child may have differed in interest in each other, in interaction styles. The degree of positive peer interaction between the target child and peer trainer may have varied as a result. Third, the interest of peer trainer in target child and the treatment situations may have varied from peer to peer resulting in variable intensity of intervention.

Certainly, the peer mediated strategy seems a reasonably useful procedure that can help develop specific important social skills under certain conditions. However the peer trainers may simply not be powerful enough to dramatically improve rates of positive social behavior for some children. Possibly if a more competent, personally interested, well matched peer child could be determined the effects might be more successful but certainly these characteristics would be difficult to ascertain.

There is also concern with the use of this technique with the continued presence of the adult supervisor in the training situation. There was considerable risk that the observed play interaction was dependent on the presence of the adult in the situation. The adult may have interfered with the development of normal reciprocal interaction if prompting was too pervasive or occurred for too long even though adult intervention was monitored and faded according to a fixed schedule.

Further Research

The following recommendations are suggested for further research in the area of peer mediated social skill training.

1. The effects on peer helpers of participating in peer mediated interventions needs to be explored. At this point only anecdotal information on the effects on the peer trainers has been collected. Positive results were reported by Raglund, Kerr and Strain (1978) who observed more positive classroom attitudes following a peer training tactic for academic skills. Little data has been collected with peers associated with social skill tactics. Several questions need to be answered. Does status change following a participation as intervention agents? Do they tend to assume an instructional role with peers? How do they view experience? Do they exhibit any positive or negative collateral behavior change during intervention?
2. The development of procedures to enhance the maintenance of treatment effects across time and the generalization of newly acquired behaviors to other settings and social contexts is another important consideration. These procedures need to include the evaluation of classroom setting and how it can be modified to promote generalization of learned skills.

3. Demonstrations of peer mediated techniques have involved relatively few children. Significant questions remain to be answered concerning the exportability of the procedure and its efficacy with different types of children e.g. severe developmental delays.

4. This technique's useability in the classroom setting needs to be explored. One cannot conclude that tightly controlled, experimenter implemented programs are directly useable by school personnel. Perhaps the program can be transformed into a form that is useable in the classroom so that its function and utility can then be better addressed.

5. Cognitive factors relating to social competence need to be addressed. How does self concept relate to social competence? Does it change with improved rates of positive social interaction or does it interfere with acquisition and generalization?

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APPENDIX

Teacher Rating Instructions

Teacher Ranking Instructions

Teacher Rating

Child's Name _____ Teacher _____

School _____ Date _____ Code _____

Rating Instructions

Please read each statement on the reverse side of this page carefully and circle the corresponding number that is descriptive or representative of the child's behavior. The numbers 1 through 5 are a continuous scale. Circling number 1 indicates that the statement is a false description of the child, circling number 3 states that the statement is moderately descriptive of the child, and circling number 5 indicates that the statement is truly descriptive of the child.

For example, an item may read as follows:

4. Smiles at other children . . .

false description		moderately description		true description
1	2	3	4	5

If you feel the child does not smile at other children, then by circling number 1, you would indicate that the statement ("Smiles at other children") is a false description and not true of that child.

Circling number 3 you would indicate that the statement ("Smiles at other children") is moderately descriptive.

Circling number 5 would indicate that the statement ("Smiles at other children") is very descriptive or true of the child. PLEASE DO NOT MAKE MARKS BETWEEN THE NUMBERS -- CIRCLE THE NUMBER THAT BEST DESCRIBES YOUR OPINION OF THE CHILD'S BEHAVIOR.

Teacher Ranking Form

The student ranking form is the first step you will complete to evaluate the social interaction frequency of the students in your class. The ranking form has been designed to allow you to systematically screen the children based upon your previous opportunities to observe their behavior. Students that you have only known for two weeks or less should be marked with a * to indicate that you might not be as familiar with them as with other students. Do not include these children in your final ranking.

Ranking Your Class

The student ranking form is comprised of three separate parts that allow you to order the children in your class according to the frequency with which they talk to each other. In Part I your task is to simply list all of the students in your class to be considered in the ranking process. This listing of students can be in any form and will probably be alphabetical if your roll book is prepared in this manner.

In Part II your task is to divide the class into two groups based upon your estimate of their interactive frequency. Those students that talk the least often are recorded at the top half of the form while the students that talk most often are recorded in the second half. Some students will be easy to place in the least often group, yet others could fit either the least often or most often group because they seem to be above average. In this case simply use your first judgment.

In Part III your task is to organize the children's names within each of the groups. Start with the least often group and pick the child who talks least often and write the name in the number 1 spot. The number 2 child would be the child that is the next least talkative in the class and so on. The last child you will assign a number will be the most talkative child.

Each time that you complete a part of the ranking form, you should count the number of children you are working with and write this number in the "Total" space provided. This will insure that you do not forget any students.